



**NATIONAL OPEN UNIVERSITY OF NIGERIA**

**SCHOOL OF HEALTH SCIENCES**

**COURSE CODE: PHS 428**

**COURSE TITLE: Use of Standing Order II**

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# **PHS 428: USE OF STANDING ORDER II**

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## **MODULE I**

## UNIT 1: REVIEW OF THE PREVIOUS KNOWLEDGE ON STANDING ORDERS

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### 1.0 INTRODUCTION

You have gone through a course that introduced you to the Standing Orders- a treatment guide being used by Community Health Practitioners. Since the Community Health Practitioners are trained to assess, make clinical judgement and treat patients, which hitherto used to be duty of a physicians, there is need for a standard protocol developed and endorsed by all stakeholders, hence the Standing Orders for treatment of diseases and problems was developed. A standing order was developed for each disease/problem. All these were bound into a book referred to as “Standing Orders”.

### 2.0 OBJECTIVES

At the end of this unit you should be able to: -

- State the definition and objectives of using the standing orders
- Discuss the assumptions behind the use of standing orders
- State the layout and format of the standing orders
- Explain the basic concepts of the different health conditions

### 3.0 MAIN CONTENT

#### 3.1 Definition and objectives of using the standing orders

You will recall that the standing orders are a set of specific guideline grouped by symptoms, which are used by Community Health Practitioners in the treatment of patients with different conditions, under primary health care arrangement.

They are written guidelines that tell how a patient is to be cared for and standard procedures to be followed at all times.

It is a type of Standard Operating Procedure (SOP) which is a set of written instructions. Use of SOPs are an integral part of a successful quality system as it provides individuals with the information to perform a job properly, and facilitates consistency in the quality and integrity of a product or end-result.

The objectives of using the standing orders include

- To ensure uniformity of care
- To ensure high standard of care
- To provide legal protection for community health practitioners
- To give confidence to the health worker, since reference material is at hand
- To promote better coverage of the population with health care
- To define safe limits that a health worker can go in treatment

### 3.2 Basic Assumptions behind the Use of Standing Orders

There are three basic assumptions behind the use of standing orders. These assumptions are pre-requisite conditions that must exist before the standing orders can be successfully used as planned.

The first assumption is that the community health practitioner will at all times be acting under the authority and legal auspices of the physician whether or not he/she is present at the centre. With the document (i.e. the standing orders), the physician has delegated part of his responsibilities and the corresponding authority to the community health practitioner to act on his behalf. It is expected that this authority is accepted by all physician at all times and everywhere in the federation. If this condition is not met, then the health worker will not be covered by law when he/she acts outside his/her traditional role.

The second assumption is that the hospital referral facilities will be available or incorporated in the plan for national health care. The primary health care programme is an integral part of the national health care system and should be seen as such by health workers at the various levels. These health workers should see themselves working together towards the same goals and solving the same health problem. This attitude creates the right atmosphere for effective referral services – where workers at high levels will receive referrals from those at the lower levels and vice-versa. If this does not happen, the patients will suffer because they get rejected at other levels of health care where they are referred to.

The third assumption is that where a physician is available to supervise patient's care, he/she will give consultation and teach the health worker. The physician should act as a consultant to the community health practitioner. Problems that the practitioner cannot deal with will be referred to the physician who should see the patient and also teach the practitioner who referred the patient.

### 3.3 The layout/format of the standing orders

The standing order is written in a concise, step-by-step, easy-to-read format. The information presented is simple, short, unambiguous and conveyed clearly and explicitly to remove any doubt as to what is required.

The review of the third Edition of the Standing Orders was embarked upon to make it more users friendly and also to include some current concepts in Health Care Delivery in compliance with internationally accepted standards. The review in particular has given the opportunity for integration of the recent changes on the National Antimalarial Treatment Policy, inclusion of new areas such as Oral Health, Health of Adolescent and the Elderly, Integrated Management of Childhood illness. The division of the Standing Orders into age groups for proper Management of their peculiar health problems

This revised edition is now arranged according to age and disease condition. At a glance a patient could be examined, his/her complaints compared to the relevant signs and symptoms of disease conditions and a good clinical judgment, management and treatment are given to the patient

The revised edition has different section according to age group as follows

Section one 0 to 1 month (New born)

Section two 1 month to 5 years

Section three 6 years to 12 years

Section four Adolescent treatment

Section five Adult treatment

Section six The elderly treatment

The treatment for diseases contained in the standing orders are grouped under the different age group

#### 3.4 The basic concepts of the different health conditions

Health according to WHO (World Health Organization) is “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.”

According to Hans Selye, health exists when an individual is in a relative state of adaptation to his environment.

Health conditions in this context are illnesses and it exists when diseases are present and the individual has some signs and symptoms which are detected by the professional. Illness exists when all the basic needs are not satisfied.

Illness is a state of disturbance of body structure or functions. Health-illness is a continuum. An individual is rarely totally healthy or totally ill, the position is constantly changing in the balance between health and illness. The individual’s position in the continuum is determined by need satisfaction, stage of disease progression and his or her perception of relative health or illness.

The anatomy and physiology describes and explain how the body is structured and how it functions. For you to understand the abnormal conditions of the body and the disease process, it is necessary to be familiar with the normal. Without the proper structural development and functioning of the body, the physical and psychosocial needs of man cannot be met.

The structural and functioning units of the body include:

Cell is the basic unit of structure and function of all living things.

Tissues a group of like cells having like functions and

Membrane thin soft sheets of tissues that cover, line, lubricate and anchor body parts.

Organs are structures made up of several tissues grouped together. They perform a more complex function than one tissue alone, their composition and structure are dependent on function.

Systems are groups of organs that contribute to the function of the whole. They perform a more complex function than one organ alone. No system can function independent of another system.

The body systems and functions are as follows

1. Integumentary (skin) – it covers and protects the body.
  2. Musculoskeletal – supports and allows movement. It also forms the body's frame work.
  3. Circulatory – transports food, water, oxygen and waste
  4. Digestive – processes food and eliminates waste.
  5. Respiratory – supplies oxygen and eliminates carbon dioxide.
  6. Urinary – excretes waste.
  7. Nervous – controls and coordinates body activities.
  8. Endocrine – regulates body activities.
  9. Reproductive – reproduction
1. Integumentary; the skin which protects deeper tissues of the body from pathogenic organisms and harmful chemicals. It also helps with excretion and regulation of body temperature, it contains millions of nerve ending which provides sensory reception, pressure, touch, pain and temperature.
  2. Musculoskeletal; comprising of the bony structure of the body and its functions includes
    - Support – forms frame work for body structures and provides shape.
    - Protection – protects the internal organs.
    - Movement – serves as levers that are activated by the contraction of an attached muscle.
    - Stores calcium and mineral used by the body when needed.
    - Produces blood cells i.e. forms erythrocytes and thrombocyte in red bone marrow
    - Muscular system – it is made up of different structures and types and the function is to produce movement by means of contraction, maintains posture and produces heat and energy.



3. Circulatory; The major function is to transport oxygen, carbon dioxide, cell waste, nutrient enzymes and antibodies through the body secondary function is to contribute to the body's metabolic function and maintenance of homeostasis.

Circulatory consists of the heart, blood vessel, blood and the lymphatic system.

Nervous system consists of the central nervous system, peripheral nervous system, autonomic and somatic nervous system.

The functions includes

- Regulates system.
- Controls communication among body parts.
- Coordinates activities of body system.

4. Respiratory system; organs of the respiratory system are nose, pharynx, larynx, trachea, bronchi and the lungs.

Respiration involves taking in of oxygen, it is used in the tissue and the giving off of carbon dioxide. It has 2 stages

External – exchange of oxygen and carbon dioxide between body and outside environment which consists of inhalation and exhalation.

Internal – exchange of carbon dioxide and oxygen between the cells and the interstitial fluid surrounding the cells

5. Digestive; the organs includes buccal cavity (mouth), pharynx, oesophagus, stomach, small intestine and large intestine. The accessory organs are liver, gall bladder and pancreas.

Function

Mechanical and chemical digestion

Absorption – this occurs in the small intestine with most water being absorbed in the large intestine

Metabolism – the sum total of all body functioning to convert simple compound into living tissues it includes catabolism, anabolism, and basal metabolism.

6. Urinary organs are kidneys, ureters, bladders, and urethra, the functions includes excretion, maintenance of water balance and regulates acid balance
7. Endocrine system it includes the exocrine and endocrine glands located in different part of the body and their functions mainly as regulators of body function in growth and development, reproduction, metabolism and fluid and electrolyte balance.
8. Reproductive system which is divided into male and female, the male reproductive organ is made up of the external genitals (scrotum& penis) testes, ducts, accessory glands (seminal vesicles, prostate and cowper's gland) semen.

The female reproductive organs are external genitals (vulva made up of, labia, majora, labia minora, clitoris, vaginal orifice and the perineum) and the internal

organs are ovaries, fallopian tubes, uterus and the vagina the accessory organ include the breasts.

The main function of the reproductive organ is the reproduction and production of hormones – testosterone in male while oestrogen and progesterone is produced in females.

9. Neurosensory system they consists of the following

The nervous system includes the brain, the spinal cord and the nerves.

The sensory system includes the

Eye - it lies in a protective bony orbit in the skull and it is for vision.

Ear – it is responsible for the transmission of sound waves resulting in hearing and is also responsible in maintenance in equilibrium.

#### 4.0 CONCLUSION

In this unit you have been reminded about the definition of standing orders. The objectives for using the standing orders were also highlighted.

The basic assumption is that the PHC worker is acting under the authority of and legal auspices of the physician at all times, referral facilities will be available or incorporated into the national health care.

You also learnt the basic concept of health conditions otherwise known as illnesses.

Illnesses are diseases and it exist when the individual has some signs (those you find out through observation/examination) and symptoms (what the patient tells you) or all when the basic needs are not satisfied.

#### 5.0 SUMMARY

This unit has focussed on the definition of the standing orders as specific guidelines arranged by symptoms which define how patients with different conditions can be cared for. The objectives and the assumptions were stated.

Anatomy and physiology of the body was also reviewed for you to be familiar with the normal and be able to understand and appreciate the abnormal otherwise known as health conditions.

#### 6.0 TUTOR MARKED ASSIGNMENT

1. State the advantages of the standing orders
2. Mention any other treatment guideline similar to standing orders
3. List 2 health conditions associated with each of the systems in the body

#### 7.0 REFERENCE AND FURTHER READING

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## UNIT 2: HEALTH CONDITIONS OF THE INTEGUMENTARY SYSTEM

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### 1.0 INTRODUCTION

In this unit, we will examine the different health conditions of the integumentary system, the various signs and symptoms that are presented as well as how it is managed.

### 2.0 OBJECTIVES

At the end of this unit, you should be able to

- Describe the integumentary system
- Identify the different health conditions of the integumentary system.
- Explain the signs, symptoms and features of health conditions of the integumentary system.
- Describe the practical demonstration of procedure for the management of conditions of integumentary system
- Describe the management of the health conditions.

### 3.0 MAIN CONTENT

- 3.1 The integumentary system, formed by the skin, hair, nails, and associated glands, enwraps the body. It is the most visible organ system and one of the most complex. Diverse in both form and function—from delicate eyelashes to the thick skin of the soles—the integumentary system protects the body from the outside world and its many harmful substances. It utilizes the Sun's rays while at the same time shielding the body from their damaging effects. In addition, the system helps to regulate body temperature, serves as a

minor excretory organ, and makes the inner body aware of its outer environment through sensory receptors.

Skin is composed of an outer layer, or epidermis, and a thicker inner layer, the dermis. A subcutaneous layer of fatty or adipose tissue is immediately below the dermis. Fibres from the dermis attach the skin to the subcutaneous layer, and the underlying tissues and organs also connect to the subcutaneous layer.

#### Functions

In addition to serving as a protective barrier, the skin helps to regulate the body temperature by several mechanisms. If heat builds up in the body, sweat glands in the skin produce more sweat that evaporates and cools the skin. When the body overheats, blood vessels in the skin dilate (expand), bringing more blood to the surface, and allowing body heat to dissipate. When the body is too cold, the blood vessels in the skin constrict, shunting blood away from the body surface, thus conserving heat. Along with temperature regulation, the skin serves as a minor excretory organ, since sweat removes small, clinically insignificant amounts of nitrogenous wastes produced by the body. The skin also functions as a sense organ since it contains millions of nerve endings that detect touch, heat, cold, pain and pressure. Finally, the skin produces vitamin D in the presence of sunlight, and renews and repairs damage to itself.

### 3.2 Different health conditions

The different health conditions of the integumentary system are those that affect the epidermal, dermal and subcutaneous layers of the skin, hair, nails and the glandular appendages.

The terms used to describe skin lesions include.

Atheroma – fatty patch or thickening on skin.

Bleb - blister filled with fluid

Bulla – large blisters filled with fluid as occurs in burns

Crust - is dried exudates (fluids which comes from the lesion and may consist of serum, blood, pus or mixtures of all.

Erythema – red area

Exudate – fluid usually containing pus bacteria and dead cells.

Fissure – groove, crack or slit as occurs with ulceration

Furuncle – painful erythematous raised lesion like boil.

Hives - solid raised and itching area usually the result of allergy

Macule – small, flat discoloured area, different from the surrounding skin

Macula papular – multiple lesions consisting of both macule and papules e.g. as in early chicken pox.

Mole-flat or raised pigmented growth

Nodule – small solid mass e.g. swollen lymph node

Papule – small red, raised elevation e.g. as in measles

Pustules - small elevation on the skin containing purulent fluid.

Ulcers – areas where skin has been destroyed

Urticaria – hives

Vesicle – small sac containing serous fluid

Wheal – raised lesion usually accompanied with itching.

Scales- are built up surface layers of the skin. They may be yellow, silvery, or grey

Dermatitis is any inflammation of the skin. There are many types of dermatitis.

Conditions affecting the skin include

### **Bacterial infections**

Suppuration (pus formation) - Pus consists of dead phagocytes, dead cells, cell debris fibrin inflammation exudates and living and dead microbes. It is contained within a membrane of new blood capillaries, phagocytes and fibroblasts.

The most common causative pyogenic (pus-forming) microbes are staphylococcus aureus and streptococcus pyogenes.

Small amount of pus form boils while larger amount form abscesses.

Impetigo – This is a highly infectious condition commonly caused by staphylococcus aureus. Superficial pustules develop usually round the nose and mouth. It is spread by direct contact and affects mainly children and immune suppressed individuals.

Cellulitis – This is a spreading infection caused by streptococcus pyogenes or clostridium perfringens. The spread of infection is facilitated by the formation of enzymes that break down the connective tissue that normally isolates an area of inflammation. The microbes enter the body through a break in the skin. The inflammation in cellulitis usually spread along the divisions between the organs under the skin.

There is usually pain in the area, but not at one definite place. There is swelling, redness and tenderness of the affected part of the body, but again it is not usually in one particular place. Blisters can form on the skin. There may be malaise, fever fast pulse etc.

Tropical ulcers- Tropical ulcer is a skin infection with special types of bacteria (Bacillus fusiformis and spirochaetes) which cause an acute severe infective ulcer, which may become chronic. The special bacteria that cause tropical ulcer may be spread by direct contact and by flies or other insects. A tropical ulcer usually comes up on exposed areas usually below the knee. First a painful vesicle forms. This bursts and leaves an ulcerating dirty surface. The ulcer spread very quickly. It is painful and itchy. The edge is slightly raised but not undermined. The surface is covered with a smelly grey-green or bloody membrane. The patient has no general signs and symptoms of infection. After about a month, the ulcer stops spreading and may heal. If it does not heal the base becomes scarred and the skin cannot then grow over the surface as there are no blood vessels from the underneath to keep it alive.

### **Viral Infections**

Human papilloma virus (HPV) – This causes warts that are spread by direct contact e.g. from another lesion or another infected individual. There is proliferation of the

epidermis and development of a small firm growth. Common sites are the hands, face and soles of the feet.

Herpes simplex (cold sore/fever blister) – This is a group of blisters on a reddened base usually on or near the mouth or genitalia.

Herpes Zoster viruses cause chicken pox (varicella) mainly in children and shingles (zoster) in adults. It is a crop of vesicles and erythema following sensory nerves on face and trunk.

Susceptible children may contact chicken pox from a person with shingles but not the reverse.

Measles – Measles starts with a runny nose, sticky eyes, a fever and a cough. A few days later, flat red rashes appear behind the ears. Next the rash become slightly raised and spreads to the face and body. The areas of redness meet together. The rash lasts for 6 or 7 days and it does not itch. The fever disappears soon after the rash has appeared, usually within three days.

Warts – This is caused by warts virus, often on the hands or feet. Warts are usually the same colour as the skin but are often raised above the surrounding skin. It does not itch and needs no treatment. May take months or years before it disappears.

### **Fungal infection**

Ring worm – This is a fungal infection transferred from person to person or from animal to person. It can occur on the scalp (tinea capitis) the body (tinea corporis) and the feet (tinea pedis). Tineapedis or athlete's foot affects the area between the toes. Tinea starts as a scaly, slightly raised pale or red patch which is not painful to touch. The rash may be itchy. As the infection grows, the skin in the middle of the rash may become normal again. The infection then looks like a ring. It causes hairs to fall out of the skin. Treating tinea infection takes a long time.

Yeast infection – Yeast are a special type of fungus. It grows in warm, wet areas of the body. They are often found between toes, near the private parts, under the breasts and under the arms. The skin will be slightly wet and may be white or red.

### **Skin infections caused by insects**

Scabies – This is a communicable infection of the skin caused by itch mite. It presents with burrows or lines of sores (row of black dots) with severe itching particularly between the fingers, front of the wrist, the elbows, the breast, the penis the pubic region and in babies the sides of the feet.

Flea bites – Fleas live in the homes and clothes of people and on animals. Flea bites are itchy, and when it is scratched there is damage to the skin and cause impetigo

Lice (pediculosis) – lice are insects that infect people. They can carry dangerous disease (e.g. typhus). But usually they only cause itching and skin rash. There are three types of lice namely

Head lice – live on the scalp and put their eggs on the hair it cause severe itching

Body lice – cause body itching, scratching and eczema or bacterial infection, especially around the waist.

Pubic lice affect the pubic area

## Other skin problems

Contact Dermatitis – an inflammatory response of the skin after contact with a specific antigen. It can be acute or chronic. In active, there is redness, swelling and exudation of serous fluid usually accompanied by pruritis (itching). This is often followed by crusting and scaling.

It may be caused by direct contact with irritants e.g. cosmetics, soap, detergent, strong acids or alkalis industrial chemicals or by a hypersensitivity reaction to e.g. latex rubber, nicked, dyes and other chemicals.

Psoriasis - a chronic condition in which there are patches of inflammation that are covered with silvery scales that shed. These usually occur on elbow, knees, lower back and scalp. They may cover the entire body, the cause is unknown. It may be a family tendency, symptoms increase during stress and high anxiety.

Acne Vulgaris – This is common in adolescent and is thought to be caused by increased levels of male hormones after puberty. Sebaceous glands in hair follicles become blocked and then infected leading to inflammation and pustule formation. In severe cases permanent scarring may result. The most common sites are the face chest and upper back.

Burns – This is the destruction of epidermis dermis and subcutaneous layers of skin. These may be caused by many types of trauma including heat, cold, electricity ionizing radiation and corrosive chemicals including strong acids or alkalis. Local damage occurs disrupting the structure and functions of the skin. Infection is a common complication of any burn as the outer barrier formed by the epidermis is lost.

Burns are classified according to their depths.

- Superficial (partial thickness) it is signs of inflammation and sometimes blistering.

- Deep (full thickness) when the epidermis and dermis are destroyed. These burns are usually painless as the sensory nerve endings in the dermis are destroyed.

Eczema- this is the most common type of dermatitis. In the acute stage, the affected area gets red, shiny and warm because the blood vessel widen. Then small vesicles appear on the surface of the skin. These vesicles soon burst. The exudates dry and form a crust. Secondary bacterial infection may occur. After sometime, chronic eczema develops. The affected area may be thick, dry, scaly and the normal lines in the skin become very deep. Crack can develop deep into the flesh underneath.

- 3.3 There are subjective and objective data that often accompany integumentary disorders  
Subjective data and symptom include: -

Changes in skin colour, texture, temperature and continuity

Perspiration or dryness

Itching, rash

Brittle, thick or soft nails

There may be fever, cough, difficult breathing, and sore throat

Hair loss

Bleeding

Erythema

There may be blisters



**Tables 1 – 5: Features of Skin problems**

**Table 1: Bacterial infections**

	<b>Rash</b>	<b>Where</b>	<b>Other features</b>	<b>Sometimes</b>
<b>Impetigo</b>	Blisters then wet red skin then dry yellow matter	Face, hands or feet	None	Cellulitis
<b>Skin ulcers</b>	<ol style="list-style-type: none"> <li>1. Skin broken</li> <li>2. Red, yellow or green matter in wound</li> </ol>	Ankles and feet	none	Cellulitis
<b>Abscess</b>	<ol style="list-style-type: none"> <li>1. Hot and painful to touch</li> <li>2. Feels like a balloon</li> </ol>	Anywhere	Fever	

**Table 2: Viral infections**

	<b>Rash</b>	<b>Where</b>	<b>Other features</b>	<b>Sometimes</b>
<b>Measles</b>	<ol style="list-style-type: none"> <li>1. Flat, then slightly raised</li> <li>2. Red</li> <li>3. Does not itch</li> </ol>	<p>Starts behind the ears</p> <p>Goes to the face and body</p> <p>Goes to all parts of the body</p>	<p>Fever and has one of the following: -</p> <p>(a) Cough</p> <p>(b) Conjunctivitis</p> <p>(c) Fluid from the nose</p>	Pneumonia
<b>Chicken pox</b>	<ol style="list-style-type: none"> <li>1. Itchy</li> <li>2. Blisters</li> </ol>	<p>Starts on the body and in hair</p> <p>Goes to arms and legs</p>	Fever	Impetigo
<b>Warts</b>	<ol style="list-style-type: none"> <li>1. No colour</li> <li>2. Raised</li> <li>3. Not itchy</li> <li>4. Hard and dry</li> </ol>	Hands or feet		

**Table 3: Fungal infections**

	<b>Rash</b>	<b>Where</b>	<b>Other features</b>	<b>Sometimes</b>
<b>Tinea</b>	<ol style="list-style-type: none"> <li>1. Scaly</li> <li>2. Slightly raised</li> </ol>	Anywhere	None	
<b>Yeast</b>	<ol style="list-style-type: none"> <li>1. Wet</li> <li>2. Itchy</li> </ol>	Between fingers, toes, under breasts, armpits and next to private parts		

**Table 4: Skin infections caused by insects**

	<b>Rash</b>	<b>Where</b>	<b>Other features</b>	<b>Sometimes</b>
<b>Flea bites</b>	Itchy spots	Anywhere		Impetigo
<b>Body lice</b>	Itchy rash	All parts of the body		
<b>Scabies</b>	1. Scaly 2. Itchy	Wrists Between fingers Anywhere but not face or scalp	Itchy rash on all parts of body	Impetigo

**Table 5: Other Skin problems**

	<b>Rash</b>	<b>Where</b>	<b>Other features</b>	<b>Sometimes</b>
<b>Allergic reaction</b>	1. Often itchy 2. Dark or red 3. Often with blisters	May be in one area All parts of the body	Crusting and scaling	Anaphylaxis and death
<b>Eczema</b>	1. Scaly 2. Itchy	Front of elbows, behind the knees, neck and face	Itchy rash on all parts of body	Impetigo
<b>Acne Vulgaris</b>	Raised and pustule formation Not itchy	Face, chest and upper back		Permanent scarring

### 3.4 Practical demonstration of procedure for the management of conditions of integumentary system

ascertain the client's age, locate the appropriate section and obtain the complaints

look up the client's condition under the table of content of the section which could be skin problems, burns, wounds, sores, ulcers and various bites and turn to the appropriate page.

The next step is to carry out detailed history taking by asking the client the following questions

The onset - when the problem started, the cause and how it started.

Location of the problem on the body

If there are changes and presence of itching, pain or burning

And if wound, ask if there is bleeding. Ask if the client is scratching it

Ask for the factors that make condition worse

Are there allergies?

Recent changes in the environment or diet

Ask about the type of accommodation, how many people share the room, what does he/she sleep on, how often he/she bathe and the cream/lotion being used.

Medications taken

Concern about appearance, change in body image and disfigurement

Changes in activities or life style caused by the disease

If burns, ask for the cause of the burns whether boiling water, hot oil chemicals or fire

Has the client been bitten by a dog, snake, scorpion or person?

The response of the client to the above is recorded on the treatment card.

You will now perform detailed examination thus, to assess the condition and be able to make clinical judgement that will lead you to the appropriate action from the standing orders.

Examine the skin for

Colour – any deviation from normal for example pallor, cyanosis, redness and jaundice.

- Turgor – evaluate hydration and elasticity
- Lesions and rashes – note the size, location distribution and colour, Type of lesion whether flat (macules), raised (flat topped or papules, lumps or nodules), pus or fluid filled, weeping and crusted, Ulcerated or if there is scratchmarks
- Cleanliness and hygiene
- Odour
- Pattern of pigmentation and hair distribution.
- Peripheral oedema

Examine the hair and scalp for unusual distribution or absence of scalp and body hair.

Texture of hair – smooth or coarse

Parasites – scalp and pubic.

Examine the nails for cleanliness, brittleness and length

General – Check

Eyes for redness, discolouration of eyelids (may be dark due to repeated scratching)

Ears for discharges

Mouth for redness of tonsils Koplik's spots

Check Temperature and record

Record all your findings on the treatment card

### 3.5 General approach to management of integumentary health conditions

From the history and examination performed assemble the relevant findings, make a clinical judgement and locate the appropriate action in your standing orders.

But generally some symptoms/conditions are managed as follows:

For pruritus (itching) administer antipruritics and antihistamines.

Keep nails short; use cotton beddings and clothing. Avoid rough fabrics. Encourage use of gloves when sleeping, bathe with tepid water and use minimal soap. Pat dry using no friction.

For fungal infections, give antifungal preparations e.g.

Benzoic acid compound ointment (Whitfield's ointment) or benzoic acid 6% and salicylic acid 3% cream or ointment

Gentian violet 0.5% solution in water or spirit (alcohol), but it is only useful in Candida ("thrush")

Anti-inflammatory preparations are used for eczema and other dermatitis to help healing.

Examples include

Potassium permanganate (Condy's crystals) 1:10,000 solution in water,

Calamine lotion,

Zinc cream

Anti-external parasite preparations include

Benzyl benzoate 25% solution,

Iodine solution 2.5% (dilute immediately before use with an equal volume of water),

Permethrin 5% (50mg/g) Cream

Permethrin 1% (10mg/g) lotion

Antibiotics (ointment/cream, powder or systemic) and antiseptics lotions are used for bacterial infections

For abscess, incision and drainage is done using aseptic technique in cleaning and dressing.

If skin lesion is infectious, use aseptic technique and disinfect all beddings and clothing.

Visit a health facility that use standing orders to manage patients, identify patients with health conditions of the integumentary system carry out detailed history and examination, make a clinical judgement and take appropriate action according to your standing order.

#### 4.0 CONCLUSION

In this unit, you have been able to identify the different health conditions of the integumentary system which are conditions that affect the epidermal dermal layers of the skin, hair, nails and the glandular appendages.

The terms used to describe skin lesions were highlighted.

You have also learnt that there are some bacteria, fungal and parasitic infections affecting the skin.

The general approach to management of skin conditions was also discussed.

#### 5.0 SUMMARY

This unit has exposed you to the health conditions of the integumentary system. The common terms used to describe skin lesion were highlighted.

The detailed history and examination to assist in the evaluation of the condition was discussed, as well as the general approach to management.

#### 6.0 TUTOR MARKED ASSIGNMENT

1. Identify disease where you can find the different skin lesions.

2. Visit a health facility; identify 5 different health conditions of the integumentary system, manage as described above. Record on the treatment card as well as your assignment note.

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## UNIT 3: HEALTH CONDITION OF THE MUSCULO SKELETAL SYSTEM

### TABLE OF CONTENTS

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
  - 3.1 The structures and health conditions of the musculoskeletal system and including the signs and symptoms that are presented in each condition.
  - 3.2 Practical demonstration of procedure for the management of musculoskeletal disorders including the detailed history and examination
  - 3.3 Management approach using the standing orders
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor Marked Assignment
- 7.0 References and further readings

#### 1.0 INTRODUCTION

In this unit you will learn the health conditions of the musculoskeletal system, the various signs and symptoms presented by the patient and also the detailed history and examination that are carried out.

#### 2.0 OBJECTIVES

At the end of this unit, you should be able to:-

- Describe the structures and health conditions of the musculoskeletal system and including the signs and symptoms that are presented in each condition.
- State the practical demonstration of procedure for the management of musculoskeletal disorders including the detailed history and examination.
- Describe how to use the standing orders to manage such health condition.

#### 3.0 MAIN CONTENT

- 3.1 The health conditions of the musculoskeletal system are the health problems of the skeleton, the skeletal muscles, ligaments, tendons, joints synovium cartilage and the bursa. Skeleton are bones of the body which could either be long, short, flat or irregular. It stores calcium, magnesium and phosphorous. The bone marrow produces red blood cell (RBC). The bones work with muscles to provide support locomotion and protection of internal organs. The skeletal muscles provide body movement and posture by tightening and shortening. They attach to bones by tendons. Contraction begins with the stimulus of a muscle fibre by a motor neuron. The energy for muscle contraction comes from hydrolysis of adenosine triphosphate (ATP) into adenosine diphosphate (ADP) and phosphate.

Residual amount of muscle contraction is known as muscle tone. Muscle relaxation results from breakdown of acetylcholine by cholinesterase.

Ligaments are tough bands of collagen fibres connecting bones to bones. They encircle a joint to add strength and stability.

Tendons are non-elastic collagen cords that connect muscles to bones.

Joints are articulations of two bones surface. It provides stabilization and permit locomotion.

The degree of joint movement is called range of motion (ROM)

Synovium is the membrane lining the inner surfaces of a joint. It secretes synovial fluids and antibodies. In conjunction with the cartilage, it reduces friction of joints.

Cartilage serves as a smooth surface for articulating bones and absorbing shock to joints.

Bursa is the fluid filled sac that facilitates motion of structures that move against each other. It gives padding to reduce friction.

### **Health Conditions**

The health conditions of the musculoskeletal system may be chronic or acute. Acute problems are usually related to simple injuries. Chronic disorders may be more distressing to the patient because of the loss of mobility and changes in self-image.

#### **The disease of bone include**

##### **Osteoporosis**

In this condition, the amount of bone tissue is reduced because its deposition does not keep pace with resorption i.e. the rate of bone resorption exceeds the rate of bone formation. Increased phosphate stimulates parathyroid activity which increases bone resorption.

Oestrogens decrease bone resorption. Osteoporosis is common in post-menopausal women and sites usually affected are vertebrae, pelvis and femur.

Exercise and calcium intake during childhood and adolescence are thought to be important in determining eventual bone mass of an individual and therefore the risk of osteoporosis in later life. As bone mass decreases, susceptibility to fracture increases.

Possible cause of this condition include: lowered oestrogen levels; immobility; liver disease; calcium, vitamin D and protein deficiencies, bone marrow disorder; lack of exercise; increased phosphorus; Cushing's syndrome and hyperthyroidism.

Possible clinical manifestations are

- Kyphosis (curving of spine)
- Back pain – thoracic and lumbar
- Skeletal deformity i.e. gradual loss of height with age caused by compression of vertebrae,
- Unsteady gait
- Joint pain
- Weakness
- Bone pain and fractures especially of the hip (neck of femur) wrist (Colles' fracture) and vertebrae.

##### **Rickets and Osteomalacia**

In these conditions there is inadequate mineralization of the bone usually because of vitamin D deficiency, or sometimes because of defective vitamin D metabolism. In children, whose bones are still growing, this leads to characteristic bowing and deformity of the lower limbs that is caused rickets. In adult, who still requires vitamin D for normal turnover of bone, deficiency leads to osteomalacia which is associated with increased risk of fracture and bone pain.

Deficiency of vitamin D may be caused by poor diet, or by limited exposure to sunlight which is needed for normal vitamin D metabolism. Some people are genetically unable to metabolize vitamin D normally, leading to poor bone mineralization.

### **Osteomyelitis**

It is the inflammation of the bone by direct or indirect invasion of bacterial organisms. They enter the blood stream through an open wound, open fracture, or by secondary invasion from blood, bone infection from a distant site such as the ear, throat or skin. This is most commonly seen in children

Infection causes destruction, bone fragments necrose (sequestra) and new bone cells form over

Sequestrum during healing process, resulting in non-union

If promptly and adequately treated, the infection can resolve without permanent damage, but if not, it may become chronic.

The possible clinical manifestations include:

- Malaise,
- Elevated body temperature, bone pain and increase pain with movement, localized oedema and redness, muscle spasms and tachycardia.

### **Arthritis**

Inflammatory joint disease and there are different types

- Rheumatoid arthritis – This is a chronic progressive inflammatory, autoimmune disease mainly affecting peripheral synovial joints. It affects the synovial lining of the joints. The inflammatory changes occur throughout the body's connective tissue, destroying not only the joints internally, but also many other sites including the heart, blood vessels and skin. The joints mostly involved are hands, wrists, elbows, knees and ankles.

It is more common in females than males and can affect all ages including children.

The cause is not clearly understood but development of autoimmunity may be initiated by microbial infection possibly by viruses, in genetically susceptible people.

Risk factors include

age – risk increase with age

gender – premenopausal women are affected three times as commonly as men

Genetic risk – there is a strong familial link in some cases, and some markers on the surface membranes of white blood cells have also been associated with higher risk of the disease.

Almost always (up to 90% of case), affected individuals have rheumatoid factor (RF) in their body fluids. High levels of RF, especially early in the disease are strongly associated with accelerated and more severe disease.

Patients with this condition usually present with Joint pain and stiffness particularly in the morning and after rest.

Limited range of movement (ROM)

There is increased pain in damp cold weather and enlarged oedematous joints.

Acute exacerbations of rheumatoid arthritis are usually accompanied by fever, and are interspersed with periods of remission. With each exacerbation, there is additional and cumulative damage to the joints leading to increasing deformity, pain and loss of function.



- Osteoarthritis – (OA)  
This is a degenerative non inflammatory disorder affecting weight bearing joints- spine, knees, hip. There is progressive degeneration of articular cartilage with age because its renewal does not keep pace with its breakdown. Cartilage softens with age, narrowing the joint space. Normal “wear and tear” thins and erodes the cartilage.  
Possible predisposing factors include aging, joint trauma and obesity.  
It present with – pain which is relieved by resting joints, joint stiffness, limited ROM, increased pain in damp cold weather.
- Gouty arthritis  
This is a joint disease caused by deposit of uric acid crystals in joints and tendon provoking an acute inflammatory response.  
Risk factors/aetiology includes obesity, heredity, hyperuricaemia and high alcohol intake, decreased uric acid excretion, chronic renal failure, myxoedema and hyperparathyroidism.  
Men older than 30 years of age are most commonly affected.

### **Herniated Nucleus Pulposa (HNP),”Slipped disc” or rupture of inter vertebral disc)**

This is the protrusion of the nucleus pulposus which compresses the nerve root of the spinal cord. Sites usually affected are between L4 and L5, L5 and sacrum, C5 and L6 and C6 and C7. The compression of the spinal cord or nerve roots causes pain, numbness and loss of motor function.

Causes may be straining of the spine in an unnatural position, degenerative changes, heavy lifting when bending from the waist and accidents.

The sign and symptoms are

- acute pain in lower back radiating across buttock and down leg weakness, numbness and tingling of foot and leg or hand.
- Neck stiffness and pain that radiate down the arm to the hand
- Weakness of affected upper extremities
- Pain on ambulation

### **Fractures**

Break in the continuity of bone may be accompanied by injury of surrounding soft tissues producing swelling and dislocation. The different types of fractures include:-

- Open (compound) fracture. There is break in the skin over the fracture site. The ends of bone may or may not be visible.
- Closed (simple) skin is intact over the site
- Complete – fracture line extends completely through the bone
- Incomplete (partial) – fracture line extends partially through the bone. One side breaks while the opposite side bends.
- Comminuted – more than one fracture with bone fragments either crushed or splintered into several pieces.
- Green stick – splintering; occurs mainly in children.

There is pain on movement of parts, tenderness deformity, oedema, bruising and crepitus

### **Sprains, strains and dislocations**

- Sprain is stretched or ruptured ligaments.  
It should be considered a fracture until proven otherwise by x-ray examination.
- Strain – muscle or tendon damage due to over stress or overstrain.
- Dislocation – joint injury and bone displacement

## **Health conditions of the muscle**

### **Muscular dystrophies**

It is an inherited disease in which there is degeneration of group of muscles. There are different types depending on:

Age of onset

Rate of progression

Groups of muscles involved.

### **Crush syndrome**

Sustained pressure on the trunk or a limb causes ischaemia resulting in massive muscle necrosis. When pressure is relieved and circulation restored, myoglobin and other necrotic products are released from damaged muscle and enter the blood. This material is highly toxic to the kidneys and acute renal failure may develop.

## 3.2 Practical demonstration of procedure for the management of musculoskeletal disorders including the detailed history and examination

Ascertain the client's age and locate the appropriate section in your Standing Orders and obtain complaints

Look up Arms and Legs problems under the table of content of the section

Detailed history includes

Take the detailed history of the complaint as follows

What the problem is, how and when it started

Did the problem start suddenly?

Ask if there is inability to move the arm and /or leg – i.e. any loss of function

Was there any accident or injury? If an injury, has he been able to use the part since the injury?

Ask if there is any pain or tingling or numbness, and feeling of joint stiffness. Is it recurrent or does it get worse quickly?

Ask if there is limited movement of the affected part

Is there any swelling of joints or fingers, toes, back of hands and feet? Any weight loss?

Is there deformity of legs with difficulty in walking? Any broken bone?

Does the occupation require heavy lifting or use of machinery?

Do the patient's occupation or recreation activities require repetitive motion of joints?

Is there fever? If yes, did it start suddenly?

Past illness history

Obtain diet history

Family history of musculoskeletal illness, injury or immune disorders

Medication history

Detailed examination includes:

General appearance: check if ill, wasted or deformed

Vital signs – temperature, pulse, respiration, blood pressure

Estimate and record the haemoglobin

Test urine for colour and sugar

Examine the limbs for – deformity

- swelling

- bleeding

- fracture

- tenderness

Skin – for redness, oedema, warmth (warmer than other parts of the body) and integrity

Skeletal deformity, limb non alignment, loss or inability to move body part, diminished abnormal, spinal curvature.

Muscle – strength, size, tone, hand grip

Ranges of motion (ROM)  
Ambulation/dependence  
Posture - any deformity or abnormal gait  
Joint – pain, tenderness stiffness  
Bony joint enlargement  
Numbness  
Impaired neurovascular status  
Make a comparison between affected and non-affected sides.  
Record both the history and examination on the treatment card.

### 3.3 General approach of management using the standing orders.

From the history and examination performed assemble the relevant findings, make a Clinical judgement and locate the appropriate action in your standing orders. Generally the action to take may include

Relief of pain

If there is fracture, apply splint to immobilize the limb and refer

If there is inflammation give anti-inflammatory drugs.

Advice on: -

Regular exercise and rest

Promote safe environment

Identify and reduce stress

Avoid precipitating factors like cold, stress, infection

Weight reduction

Adequate diet therapy e.g. Low calorie diet therapy

### 4.0 CONCLUSION

In this unit, the health conditions of the musculoskeletal have been discussed to include both acute and chronic disorders. The disorders often lead to loss of mobility and changes in self-image. They may be caused by accident, nutritional deficiency, aging process or exposure to damp/cold weather.

The general principle of management include: relief of pain, heat therapy, regular exercise, rest, dietary therapy and avoidance of precipitating factors.

Some of the conditions cannot be managed at Primary Health Care Level and must therefore be referred to a higher level.

### 5.0 SUMMARY

This unit discussed the musculoskeletal system health conditions.

There was a brief review of the anatomy and physiology and then the pathophysiology which is the health conditions.

The detailed history, examination to be performed and the general approach to management was also discussed.

### 6.0 TUTOR MARKED ASSIGNMENT

1. What are the causes of decreased bone mass?
2. List health conditions of the musculoskeletal system that must be referred to a higher level.

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## UNIT 4: HEALTH CONDITIONS OF THE CARDIOVASCULAR SYSTEM

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  - 3.1 Overview of the anatomy and physiology of the cardiovascular system
  - 3.2 Symptoms and signs of cardiovascular diseases
  - 3.3 Health conditions of the cardiovascular system
  - 3.4 History and examination for cardiovascular system
  - 3.5 Procedure for the management of cardiovascular system disorders
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor Marked Assignment
- 7.0 References and further readings

### 1.0 INTRODUCTION

This unit will discuss the health conditions of the circulatory system or cardiovascular system. Cardiovascular health problems occur across the age continuum. To reduce death, burden of the disease and disability, our aims would include early detection of the disease, appropriate treatment to control the disease progression and reduction of the risk factors predisposing to cardiovascular health problems as well as how you can identify and manage it with your standing orders.

### 2.0 OBJECTIVES

At the end of the unit, you should be able to

- Give the overview of the anatomy and physiology of the cardiovascular system
- Highlight the symptoms and signs of cardiovascular diseases
- Describe the health conditions of the cardiovascular system
- State the detailed history and examination that are performed.
- Explain the procedure for the management of such conditions

### 3.0 MAIN CONTENT

#### 3.1 Overview of the anatomy and physiology of the cardiovascular system

The heart, blood, and blood vessels are the three structural elements that make up the circulatory system.

The heart is the engine of the circulatory system. It is divided into four chambers: the right atrium, the right ventricle, the left atrium, and the left ventricle. The walls of these chambers

are made of a special muscle called myocardium, which contracts continuously and rhythmically to pump blood.

The pumping action of the heart occurs in two stages for each heart beat:

- diastole, when the heart is at rest; and
- systole, when the heart contracts to pump deoxygenated blood toward the lungs and oxygenated blood to the body.

During each heartbeat, typically about 60 to 90 ml of blood are pumped out of the heart. If the heart stops pumping, death usually occurs within four to five minutes.

Blood consists of three types of cells:

oxygen-bearing red blood cells,

disease-fighting white blood cells, and

blood-clotting platelets,

all of which are carried through blood vessels in a liquid called plasma.

Plasma is yellowish and consists of water, salts, proteins, vitamins, minerals, hormones, dissolved gases, and fats.

Three types of blood vessels form a complex network of tubes throughout the body. Arteries carry blood away from the heart, and veins carry it toward the heart. Capillaries are the tiny links between the arteries and the veins where oxygen and nutrients diffuse to body tissues. The inner layer of blood vessels is lined with endothelial cells that create a smooth passage for the transit of blood. This inner layer is surrounded by connective tissue and smooth muscle that enable the blood vessel to expand or contract. Blood vessels expand during exercise to meet the increased demand for blood and to cool the body. Blood vessels contract after an injury to reduce bleeding and also to conserve body heat.

Arteries have thicker walls than veins to withstand the pressure of blood being pumped from the heart. Blood in the veins is at a lower pressure, so veins have one-way valves to prevent blood from flowing backwards away from the heart. Capillaries, the smallest of blood vessels, are only visible by microscope—ten capillaries lying side by side are barely as thick as a human hair.

The arteries, veins, and capillaries are divided into two systems of circulation: systemic and pulmonary. The systemic circulation carries oxygenated blood from the heart to all the tissues in the body except the lungs and returns deoxygenated blood carrying waste products, such as carbon dioxide, back to the heart. The pulmonary circulation carries this spent blood from the heart to the lungs. In the lungs, the blood releases its carbon dioxide and absorbs oxygen. The oxygenated blood then returns to the heart before transferring to the systemic circulation.

The function of the heart, blood, and blood vessels is to transport oxygen and nutrients to organs and tissues throughout the body and carry away waste products. Among its vital functions, the circulatory system increases the flow of blood to meet increased energy demands during exercise and regulates body temperature. In addition, when foreign substances or organisms invade the body, the circulatory system swiftly conveys disease-fighting elements of the immune system, such as white blood cells and antibodies, to regions under attack. Also, in the case of injury or bleeding, the circulatory system sends clotting cells and proteins to the affected site, which quickly stop bleeding and promote healing.

### 3.2 Symptoms of cardiovascular disease

Abnormal shortness of breath (dyspnoea)

With mild disease, shortness of breath occurs only after exercise (i.e. walking fast, carrying heavy things). When it is getting worse, it occurs even when patient is walking slowly or just sitting. When it becomes severe, lying down makes the shortness of breath even worse and sitting up makes it a little better.

Oedema

Oedema (swelling caused by fluid) of the ankles occurs if the patient walks around. Oedema of the back occurs if the patient spends most of the time lying down.

Chest pain

If pain is from the heart, it is in the centre of the front of the chest but may also be felt in the arms or jaws. Heart pain is usually like a tight band around the chest or a heavy weight on the chest. It is of few types: - angina pectoris comes only when the heart is doing more work pumping more blood, e.g. on exertion. Myocardial infarction pain is constant while pericarditis pain may be constant but may be worse on breathing or swallowing.

Palpitations

Palpitations are present when the patient feels his heart beating faster or harder than normal or irregularly.

#### Signs of cardiovascular disease

Pulse rate, regularity and volume

The normal pulse rate for adults is 60-80/minute, regular in time and has a good volume - you can feel it beat strongly. In cardiovascular disease, the pulse may be

Fast – tachycardia (more than 100/minute) or

Slow – bradycardia (less than 60/minute) or

Weak – small volume (which means that each contraction of the heart pumps less blood than normal into the arteries) or irregular in time.

Blood pressure (BP)

The normal BP is 100-140 systolic (but it can be lower) and 70-80 diastolic (but it can be lower)

Many people may have BP lower than  $100/70$  mm/hg. If they feel well, the pulse is not fast, there is no problem. If the patient has low BP caused by shock, he will also have the other symptoms and signs of shock.

If the BP is higher than 140 systolic or 90 diastolic the patient has high blood pressure or hypertension.

Signs of heart failure

Raised jugular venous pressure	} (almost always)
Enlarged liver	
Oedema	
Fast pulse (usually)	
Cyanosis (often)	
Crackles in the lungs (sometimes)	

Signs of shock

The patient is dizzy, may faint, restless or even unconscious

The pulse is fast (over 100) and of small volume, sometimes you cannot feel it at all.

The blood pressure is low – sometimes you cannot record it at all

Shortness of breath (usually deep breaths)

Paleness

Skin cold and moist

The patient makes little or no urine

### 3.3 Disorders of the circulatory system

**Arteriosclerosis:** - a process in which the arterial walls harden, thicken and lose their elasticity resulting in restricted blood flow. The underlying mechanism is the formation of fatty plaque deposits in the arteries. The plaque increases in size and ultimately obstructs blood flow to vital areas. Possible aetiology includes aging process, stress. Genetics and depletion of oestrogen.

Arteriosclerosis is associated with the following health problems:-

- coronary artery problems
- angina pectoris
- myocardial infarction
- hypertension
- peripheral vascular disease
- cerebro vascular accidents (strokes)

The signs and symptoms will vary depending on the arteries affected by the sclerosing process.

Extremity involvement - Cramping pain, numbness and tingling

Reduced circulation causing ulceration or pain outward changes include skin pallor, cool skin, reduced or absent pulses, loss of hair on extremities and skin ulceration.

Coronary involvement - Chest pain, dyspnoea, palpitation, fainting, fatigue

#### **Angina Pectoris**

Episodes of acute chest pain resulting from insufficient oxygenation of myocardial tissue.

Episodes occur most frequently during period of physical or emotional exertion, exercise, eating a heavy meal and environmental temperature extremes.

Episodes seldom last more than 15 minutes.

The major cause is arteriosclerosis. Narrowed coronary arteries obstruct blood flow, thus oxygen carried by the blood cannot sufficiently meet tissue demands, particularly during periods of exertion.

The signs and symptoms are

Substernal crushing compressing chest pain which may radiate to arms lasting 3 to 5 minutes usually brought on by exertion, exposure to cold or emotional excitement

Dyspnoea (difficulty in breathing)

Tachycardia

Palpitation

Diaphoresis

Epigastric distress

History of chest pain with activity

Pain at rest

Sensation of heaviness, choking or suffocation

Anxiety or feeling of impending doom.

#### **Hypertension (High Blood Pressure)**

It is characterized by persistent elevation of blood pressure in which the systolic pressure is above 140mmHg and the diastolic pressure is above 90mmHg.

Primary hypertension (essential) is a persistent elevation of blood pressure without an apparent cause. Primarily, small blood vessels are affected, peripheral resistance increases and blood pressure rises.



Constricted blood vessels eventually cause damage to organs that rely on a blood supply from these vessels.

Secondary hypertension is a persistent elevation of blood pressure associated with another disease state. For example renal disease, toxemia in pregnancy, adrenal dysfunction, atherosclerosis, coarctation of the aorta.

Predisposing factors are:-

Smoking

Obesity

Heavy salt and cholesterol intake

Heredity

Aggressive, hyperactive personality

Age – develops between 30 and 50 years of age

Sex – Primarily men over 35 years and women over 45 years of age.

Race – blacks have twice the incidence of whites

Birth Control Pills and oestrogen.

Signs and symptoms may be insidious and vague. A person can have the disorder and not know it.

1. Tinnitus
2. Light headedness
3. Blurred vision
4. Irritability
5. Fatigue
6. Tachycardia
7. Palpitations
8. Occipital, morning headaches
9. Dizziness
10. Nose bleeds (epistaxis)

### **Myocardial Infarction (Heart Attack)**

The obstruction of a coronary artery or one of its branches which results in death of portion of myocardial muscle cells supplied by that vessel. A myocardial infarction can occur whenever a coronary artery or branch of the artery becomes occluded by a thrombus, emboli or the atherosclerotic process. The myocardial tissue dies because of oxygen deprivation.

The heart's ability to regain and maintain its function depends on the location and size of the area of infarction.

Signs and Symptoms Include:-

“Crushing” chest pain lasting longer than 15 minutes and unrelieved by rest or drugs.

Shortness of breath

Nausea and vomiting

Tachycardia

Diaphoresis and pallor

Dyspnoea

Arrhythmias

Increased temperature

Anxiety

### **Congestive Heart Failure (CHF)**

This occurs as a result of failure of the pumping mechanism of the heart resulting in an insufficient blood supply to meet the body's needs. It could be the right or left side of the heart that fails to pump enough blood to meet the metabolic demands of the body.

The underlying mechanism involves the failure of the pumping mechanism of the heart to respond to the metabolic changes of the body. The end result is a heart that cannot supply a sufficient amount of blood in relation to the body's needs and to the amount of blood returning to the heart (venous return). There is a build up pressure in the vascular beds on the affected side of the heart.

Possible causes include:-

Atherosclerosis

Left – sided congestive heart failure

Chronic obstructive pulmonary disease (COPD)

Valvular stenosis

Valvular insufficiency

Signs and Symptoms:

Signs and symptoms are divided into left sided failure and right sided failure although both sides may be affected.

- Left sided failure leads to pulmonary congestion and presents with Dysrhythmias, Dyspnoea, Tachycardia, Tachypnoea, Orthopnoea.

Non-productive cough that worsens at night

As severity increases, frothy, blood-tinged sputum is noted

Anxiety and restlessness, Fatigue.

- Right sided failure may follow left sided failure and results in systemic venous congestion, weight gain caused by fluid accumulation in the tissues.

Dependent oedema in the form of ankle oedema or sacral oedema.

Ascites caused by collection of fluid in the abdominal cavity. Ascites may also hinder respiration

Fatigue

Gastro – intestinal symptoms such as nausea, vomiting and anorexia

Decreased urine output

Hepatomegally

### **Valvular Disease**

Valvular dysfunction results in either stenosis or insufficiency of the heart valves.

Valvular stenosis occurs as a result of cardiac infections, the valve leaflets (cusps) becomes fibrotic and thicken and may even fuse together thus hindering blood flow.

Valvular insufficiency occurs in much the same way as valvular stenosis, after repeated infections the valve leaflets (cusps) become inflamed and scarred and no longer close completely.

The incomplete closure allows blood to leak from the left ventricle into the left atrium during systole.

Blood flow through the heart is altered, resulting in decreased output, systemic and pulmonary congestion and dilation of the heart chambers.

The causes include:-

Rheumatic heart disease which is the primary cause of valvular dysfunction

Papillary muscle dysfunction

Bacterial endocarditis

Congenital malformations

Trauma, syphilis

Signs and symptoms depend on the valve that is affected.

If the mitral valve is affected e.g. for mitral stenosis there will be

Dyspnoea on exertion, low cardiac output, Orthopnoea, peripheral oedema, Cough,

Pink – tinged sputum, Tachycardia, Fatigue, Palpitations, Heart murmur

For Mitral Insufficiency

Fatigue, Shortness of breath, Dyspnoea on exertion, Cough, Heart Murmur, Peripheral oedema, Orthopnoea, Pulmonary congestion,

For Aortic Stenosis there will be

Fatigue, Angina pectoris, Syncope, Heart murmur, CHF, Orthopnoea

For Aortic Insufficiency there will be

Palpitations, Dyspnoea on exertion, Fatigue, Orthopnoea, Angina, pain even at rest.

Neck pain, Dizziness, Tachycardia

### **Phlebitis and Thrombophlebitis:**

These are inflammatory disorder of the vein. Phlebitis is the inflammation of vein while thrombophlebitis is the inflammation of a vein with clot formation.

Causes

The inflammation and clot formation are associated with various stasis, vessel damage and enhanced blood coagulability.

Situations that produce venous stasis include immobility, prolonged periods of standing, wearing confining clothing and increased abdominal pressure, varicose veins, pregnancy, CHF and prolonged bed rest can also cause venous stasis.

Hypercoagulability – in cancer, blood dyscrasias

Injury to the venous wall during intravenous injections, fractures, antibiotics Venous stasis, hyper-coagulability of the blood and injury to the venous wall result to the massing of red blood cells in a fibrin network.

As the thrombus enlarges, it causes an obstruction resulting in venous insufficiency.

Common sites are deep veins and superficial veins.

Signs and Symptoms

When it is Superficial, there will be red, warm skin, which is sensitive and tender to touch.

When deep veins are involved, there will be oedema, pain on dorsi-flexion of the foot, cramping pain, Elevation of temperature, Swelling, Redness and pain along vein path.

### **Embolism**

It is a blood clot circulating in the blood. The clot may be a fragment of an arteriosclerotic plaque or it may have originated in the heart.

If large, an embolism may lodge in a vessel bifurcation and obstruct the flow of blood to vital organs or tissues.

Most emboli arise from deep vein thrombi, the emboli travels in the blood stream until it lodges in a narrowed area, usually the lungs.

Signs and Symptoms are

Pain at the site, Shock

On the area supplied by the involved vessels, there is evidence of pallor, coldness, numbness tingling and cyanosis, sudden onset of dyspnoea

Cough and haemoptysis, Chest pain, Tachycardia, Tachypnoea

### **Varicose Veins**

This is a dilated tortuous leg veins resulting from blood back-flow caused by incomplete valve closure. This leads to congestion and further enlargement of the vein.

The basis cause of varicose is unknown, but some factors that predispose a person to varicose veins include heredity, pregnancy, obesity and aging.

Signs and symptoms include

Leg fatigue and aching

Leg cramping and pain

Heaviness in the legs

Dilated veins

Ankle oedema

### 3.4 The detailed history for the cardiovascular system include

Ask the patient following:

- The exact problem, when it started and how long he/she has had it
- Any cough
- If cough is present, do you bring up sputum? If so, what is the colour? Any haemoptysis
- Ask if there is tightness of chest/chest pain. If so, where? Does deep breathing, bending, periods of physical and emotional stress make it worse? – Record onset of pain, duration and intensity. Does the pain/discomfort start on exertion, or made worse by exertion? Does it start even at rest? Is it relieved by rest or not?
- Any shortness of breath? Do you sleep flat or do you need several pillows at night? Do you sometimes have to get up at night to breath?
- Ask if there is shortness of breath/difficult breathing either at rest or on exertion. Does he/she get tired easily or have blue lips or finger nails?
- Any palpitations?
- Is there headache, dizziness or actual fainting?
- Family history of heart disease or hypertension
- Any swollen feet?

Ask about the dietary pattern and if there is any habit like smoking.

Ask if on any medication

The detailed examination include

- General appearance – check if ill, in pain, thin, pale, cyanosed or anxious
- Observation of the skin for temperature and colour, jaundice, cyanosis and pallor
- Auscultation of vascular bruits and murmurs or any abnormal heart sound.
- Examine the neck for distended veins
- Observation of the thorax for precordial movement.
- Examine the extremities for club – shaped fingers and toes, presence of oedema
- Vital signs –
  - Pulse – rate, volume and whether regular or not
  - Respiration – rate and any abnormality
  - Blood Pressure – measure and record
- Chest examination – auscultation of the lungs for crackles, rhonchi, wheezes and decreased breath sounds
- Heart – rate, rhythm, murmur
- Legs – presence of oedema
- Abdomen – check for tenderness, distension and enlarged liver

### 3.5 General Approach to Management

To manage the patient using the standing orders, ascertain the age and locate the appropriate section in your Standing Orders under Chest/Heart problems and Abnormal Blood Pressure.

Take the history as stated above

Perform the detailed examination as above

From the history and examination performed assemble the relevant findings, make a Clinical judgement and locate the appropriate action in your standing orders.

Most of the conditions are to be referred by the CHO. The CHO should identify the condition early, as early diagnosis and treatment will limit disability.

However, the following are basic to the management of cardiovascular disorder.

- Dietary restriction of fat, cholesterol and salt.
- Restriction/elimination of risk factors such as
  - Smoking
  - Obesity – encourage weight management
  - Stress
  - Lack of exercise

For phlebitis thrombophlebitis and varicose veins the treatment include

- Bed rest
- Warm, moist packs to the affected part
- Wearing of antiembolism stockings.
- Elevation of affected extremity.
- Prevention of pressure on extremities
- Use of special devices such as bed cradles, planned exercise

#### 4.0 CONCLUSION

In this unit, the cardiovascular organ was discussed, which is the heart and blood vessels.

The health conditions discussed include arteriosclerosis which occur when the arterial walls hardens, thicken and lose their elasticity, hypertension which is high blood pressure and varicose veins to mention a few.

There are some risk factors associated with these condition and they include diet high in fat and cholesterol, high sodium intake, smoking, obesity, stress and lack of exercise.

The general principle in management is to detect the disease early, give appropriate treatment to control the disease progression and reduction of the risk factors in a bid to reduce death and disability from the health conditions of the circulatory system.

#### 5.0 SUMMARY

In this unit, you learnt the health conditions of the circulatory system the detailed history and examination that are performed and also the general approach to the management of such conditions. In the next unit, health conditions of the blood will be discussed.

#### 6.0 TUTOR MARKED ASSIGNMENT

- 1a. Enumerate the terms that are used in the health conditions of the circulatory system.
- b. Give the definition of each of the terms enumerated.

#### 7.0 REFERENCE AND FURTHER READING

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## UNIT 5: HEALTH CONDITIONS OF THE HAEMATOLOGIC SYSTEM

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#### 1.0 INTRODUCTION

This unit will discuss the health conditions of the blood forming tissue which include the blood cells, bone marrow, spleen and lymph system. This discussion will include description of anaemia, leukaemia and acquired immune deficiency disease

#### 2.0 OBJECTIVES

At the end of the unit, you should be able to

- Explain the anatomy and physiology of blood and blood cells
- Describe the disorders of haemopoiesis
- State the detailed history and examinations that are performed
- Explain the general approach to the management of such conditions.

#### 3.0 MAIN CONTENT

- 3.1 The blood is made of two kinds of blood cell – Red Blood Cells (RBCs) and White Blood Cells (WBCs). Platelets are detached (broken off) parts of special cells which stay in the bone marrow. The blood cells are suspended in the plasma. The plasma is made of water which carries many things (some dissolved) in it. Protein, sugar, fats, and salts are all carried in the plasma.

Blood is made in the following parts of the body:

- Bone marrow – the red bone marrow in the ends of the long bones and in the flat bones (e.g. sternum and pelvis) is most important for making blood. RBCs and most WBCs and platelets are made in the marrow.
- Spleen
- Liver
- Lymph nodes

The bone marrow needs iron, folic acid, vitamin B<sub>12</sub>, protein and many other things to make blood. These things are all in good diet which includes proteinous and protective foods. Without enough iron, folic acid and protein in the diet, even a normal bone marrow cannot make enough blood.

The body circulates blood to all its organs. The blood keeps the cells of these organs alive and functioning properly. Blood takes used and waste material and carbon dioxide away from the cells. The functions of the different parts of the blood are as follows: -

- Red Blood Cells (RBCs) – it contains haemoglobin (Hb) that carry oxygen.
- White Blood Cells (WBCs) – it fight infection
- Platelet – make the blood clot to stop bleeding
- Serum Protein
  - Antibodies – fight infection
  - Albumin – keeps water inside the blood vessels
  - Clotting proteins – make the blood clot to stop bleeding
  - Body building and repair proteins – build and repair the body
- Sugar (glucose) – for body nutrition and energy
- Fats – for body nutrition and energy
- Hormones – carry messages from one part of the body to another part
- Salts
- Water – contain the other parts of the blood and also make up the main volume of blood

3.2 Disorders of haemopoiesis refer to problems of the blood forming tissues. Too little or too much parts of the blood may cause these conditions and they include

### **Anaemia**

Microsoft® Encarta® 2009, define anaemia as a blood condition in which there are too few red blood cells or the red blood cells are deficient in haemoglobin, resulting in poor health.

- Anaemia due to alteration in RBC production

Normally there is a balance between RBC production and RBC destruction. However, alterations do occur that significantly affect RBC production. Such alteration could be due to

- Iron deficiency – when there is insufficient dietary intake or malabsorption of iron, which is needed for the formation of haemoglobin and RBCs. This type of anaemia can be also be caused by blood loss and haemolysis.
- Lack of intrinsic factors in the Gastro Intestinal (GI) tract which is needed for the absorption of vitamin B12. It occurs when there is loss of the mucosal surface of the GI tract which secretes intrinsic factor. It can also occur in patients undergoing total gastrectomies and small bowel resections  
This type of anaemia is known as Pernicious anaemia.
- Folic Acid Deficiency – Folic acid is necessary for the production of RBCs.  
Anaemia due to folic acid deficiency may occur as a result of poor diet, (lacking in green leafy vegetables, citrus fruits, liver, grains and dried beans) malabsorption and drugs that interfere with the absorption of folic acid.
- Thalassaemia – unlike the others discussed above thalassaemia is a genetic disorder resulting in abnormal haemoglobin synthesis. The marrow was abnormal from birth. The main problem is an inadequate production of normal haemoglobin. Haemolysis is a secondary problem.

Mild form of this anaemia may be asymptomatic but patients with a more severe haemolytic form may experience hypertrophy, splenomegaly, jaundice and bone marrow hypertrophy.



- Anaemia due to RBC Destruction

This is a process in which RBCs are being destroyed faster than they are produced.

Known causes of RBC destruction include

- Snake venom
- Infections e.g. Malaria
- Drugs or chemicals especially in patients born without enough G6PD (a special part of the red blood cells)
- Heavy metals or organic compounds
- Antigen – antibody reaction
- Splenic dysfunction
- Congenital causes include
  - Thalassaemia – a group of hereditary haemolytic anaemia characterized by a defect in one or more of the haemoglobin polypeptide chains.
  - Sickle Cell Disease: - This is a heterogeneous group of disorder resulting from simultaneous inheritance from both parents of sickle cell gene(s). It is a hereditary problem that occurs mainly in blacks.

It causes breakdown of red blood cells carrying an abnormal haemoglobin ‘S’ which leads to a severe haemolytic anaemia.

Clinical manifestation of the disease is attributed to the sickling of the red blood cells and to the increased viscosity of such blood. These factors combine to produce capillary erythrosthiasis, vascular occlusion, occasional haemorrhage, infection and ischaemic necrosis in different parts of the body.

The newborn sickler is healthy at birth because of the foetal haemoglobin which only gets replaced by sickle haemoglobin by the age of 5 to 6 months, when symptoms begins to appear.

There is chronic haemolytic anaemia.

In an attempt to compensate for chronic anaemia, the bone marrow is maximally hyperactive. The marrow – producing bones consequently expand, giving rise to the prominent skull and facial bones evident in many sicklers.

Chronic anaemia also causes compensatory changes in the cardiovascular system which is responsible for the warm skin, bounding pulse and cardiomegaly found in most sicklers.

The symptomatology of sickle cell anaemia in infancy, particularly in the first few months of life is generally very bizarre and non-specific. It includes irritability, recurrent fever, abdominal colic, diarrhoea, coughing and failure to thrive.

Occurrence of painful swellings which usually involve both hands and feet symmetrically making them tense, tender and non - pitting in character is so special diagnostic significance in infancy.

“Sickle Cell Crisis” – This refers to the episodes of acute illness attributes to the sickling phenomenon, vaso-occlusive crisis which is the most common, affecting the bones which become mildly or severely painful.

The pain is self-limiting lasting an average of 3 – 4 days. It is precipitated by unfavourable environmental factors such as infections (viral malarial, bacterial) cold, damp weather, trauma, strenuous exercise, exposure to high altitudes pyrexia, folic acid deficiency and later pregnancy.

Anaemic crisis which becomes critical when there is a large or sudden reduction in the Hb level of the patient induces dyspnoea on slight exertion or at rest and even results in heart failure.

- Glucose - 6- phosphate dehydrogenase (G6PD) deficiency is a haemolytic disorder brought on by such stressors as infection, certain drugs, acidosis and toxic substances. Individuals with this genetic disorder are usually symptoms free until they experience the stressor that initiates the haemolytic process.

#### - Aplastic Anaemia

This is failure of the bone marrow to produce adequate amounts of erythrocytes, leukocytes and platelets.

The exact cause is unclear; it may be congenital, or related to radiation exposure. It may also result from a disorder that suppresses bone marrow e.g. cancer.

Exposure to toxic substances may be a contributing factor.

Signs and symptoms of anaemia

Pallor of

- Mucous membrane of the mouth inside the lips
- Conjunctivae under the lower eyelids
- Finger nail beds
- Palm of hands
- All the skin

Weakness or tiredness

Dizziness

Shortness of breath

### **Leukaemia**

This is a disorder of the haematopoietic system characterized by the production of immature WBCs'. As the disease progresses, fewer normal WBCs are produced. The abnormal cells continue to multiply and eventually damage the bone marrow, spleen, lymph nodes and other organs.

There are 2 major categories of leukaemia which is acute and chronic.

Acute leukaemia has a rapid onset and the cells in this phase are young, undifferentiated and immature.

Chronic leukaemia has a gradual onset and the cells are of a mature differentiated type.

Further, classification of leukaemia is done by identifying the type of WBC involved.

Leukaemia is considered a neoplastic process, the cause is unknown.

However, some factors can predispose to it and they include:-

- Familial tendency
- Viral origin
- Exposure to chemicals
- Exposure to radiation

The signs and Symptoms include:-

- General symptoms of anaemia
- Decreased resistance of infection
- Fever
- Bleeding tendencies
- Enlarged lymph nodes
- Splenomegaly
- Hepatomegaly
- Elevated WBC count
- Low platelets, count and low haemoglobin and haematocrit levels.
- Poor appetite
- Mouth ulcers
- Diarrhoea.

## **Haemorrhage**

Haemorrhage is excessive bleeding i.e. the loss of blood from a ruptured blood vessel, either internally or externally

Types of haemorrhage include

Venous – dark colour and steady flow

Arterial – bright colour and spurts

Capillary – red and oozes.

When the haemorrhage is severe, it can lead to shock.

- Shock is a depressed state of vital body functions that if untreated could result in death.

The type of shock in this situation is known as hypovolemic shock, which is a decrease in circulating blood volume due to haemorrhage.

- Signs and Symptoms of hypovolemic shock

Shallow rapid respiration, weak thready pulse, decreased blood pressure

Cold, pale, clammy skin

Thirst, restlessness, decreased urine output, may become confused or disorientated

## **Acquire Immune Deficiency Syndrome (AIDS)**

This is a viral disorder that disrupts the balance of T-lymphocytes and ultimately destroys them, rendering the body incapable of defending itself against infection. The course is progressive and fatal

This health condition is caused by sexual contact, sharing of infected needles by drug abusers and blood and blood products.

Infected mother can pass on the virus to the unborn baby.

The virus may also enter the body when contaminated blood or body fluids come in contact with broken skin surfaces.

Signs and Symptoms Recurrent

fever, night sweats Weight loss,

diminished appetite Cough,

shortness of breath

Skin rashes

White patches or lesions in the mouth

Swollen lymph glands

- 3.3 Most patients will not come to the health facility and complaint of anaemia and it is the most important disease abnormality of the blood. For this reason therefore, look for anaemia in all patients that you see.

The standing order to use will depend on the age of the patient.

The detailed history

Ask the following questions from the patient

- The onset of the problem
- If there is bleeding from any source – nose, gums; coughing or vomiting blood; blood in stool or urine; any blood from injury; any black stool  
If female ask if there is vaginal bleeding
- Any numbness, tingling and burning of the feet? Any sore tongue
- Any bone or joint pains, or painful swelling of the fingers, toes, back of hands and feet?
- Any fever, headache, dizziness? If there is fever, for how long?
- Any weakness and fatigue, irritability,
- Ask if the patient has good appetite and the kinds food he eats
- Ask if there is anorexia, nausea and vomiting, diarrhoea
- Ask if there is abdominal pain and if he has passed any worm

- Any dyspnoea or shortness of breath or do you wake up at night short of breath?  
How many pillows do you need to sleep on?
- Any pruritus
- Weight loss
- Any swollen or puffy eyelids, blurred vision
- Ask is there has been exposure to chemicals or radiations
- Has any medication been taken?

Carry out detailed examination as follows:

Skin – examine for pallor and jaundice on the finger nail bed, the palms of hands and all the skin. Check for dermatitis

Eyes – examine conjunctiva for pallor, jaundice, check for swollen or puffy eyes

Mouth – examine for smooth tongue, white patches / lesions ulcerations of the mucosa, and the mucous membrane of the mouth inside the lips for pallor

Cardiovascular – Check and record the pulse, any tachycardia?

Listen to the heart sounds and note the rate, rhythm and if there is murmur.

Check and record the blood pressure (BP)

Respiratory – check and record the respiratory rate. Note if there is tachypnoea, dyspnoea or orthopnoea. Note any flaring of the nose, lower chest in drawing and grunting respiration

Gastro Intestinal – palpate the abdomen for tenderness, rigidity, hepatomegaly and splenomegaly check for abdominal distension

Limbs – check for swollen and tender joints, feet and /or digits or back of hands and feet check for any numbness tingling and burning of feet.

General - Any weight loss

Check temperature

Check for bleeding from any source

Blood test in the laboratory for haemoglobin level, PCV and genotype.

### 3.4 General Approach to Management

To manage the patient using the standing orders, ascertain the age and locate the appropriate section in your Standing Orders under Pallor (or Low Haemoglobin)/Anaemia and turn to the appropriate page

Take the history as stated above

Perform the detailed examination as above

From the history and examination performed assemble the relevant findings, make a Clinical judgement and locate the appropriate action in your standing orders.

Generally the management approach: -

For anaemia due to decreased RBC production

- Administer iron therapy
- Increase dietary iron intake
- Vitamin B12 replacement
- Folic acid replacement
- Nutritional counselling
- Regular deworming

Severe cases are referred for blood transfusion for anaemia due to RBC destruction.

- Identify the cause agent
- Genetic counselling
- Regular clinic attendance for follow up
- Educate client and family concerning drugs, diet activities and compliance to the prescribed treatments.

For Haemorrhage  
Control bleeding by direct pressure  
Monitor vital signs  
Put patient in supine position with legs elevated.  
Fluids replacement  
Refer immediately.  
Conditions that are not covered by the standing orders are to be referred to a higher level of care.  
Visit a Primary Health Facility identify 6 patients (2 from each section of the standing orders) with pallor/anaemia. Manage as described above.

#### 4.0 CONCLUSION

In this unit, you have learnt the disorders of blood forming tissues which include the erythrocytes thrombocytes, and the leukocytes.

The disorders include anaemia which is the decreased in RBC production. It is of various types and could be due to problems with production or destruction of RBC. There are some genetic disorders that cause anaemia. The commonest in our communities is sickle cell disease.

The signs and symptoms were highlighted and well as the detailed history and examination.

The patients with these conditions are managed with the standing orders and those not covered by the standing orders are referred to higher level.

#### 5.0 SUMMARY

This unit focused on disorders of haemopoiesis which refers to the problems of blood forming tissue. This major condition is anaemia.

The detailed history and examinations was also discussed.

Patients with such conditions are managed with the standing orders.

#### 6.0 TUTOR MARKED ASSIGNMENT

Discuss the causes of anaemia due to infection

Submit the record of 6 patients managed for anaemia at the health facility.

#### 7.0 REFERENCE AND FURTHER READING

- Anthony, C. P. & Thibodeau, G. A. (1998) Basic concept in anatomy and physiology (8th ed.). St. Louis: Mosby
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## **MODULE II**

## UNIT 6: HEALTH CONDITIONS OF THE GASTROINTESTINAL SYSTEM I

### TABLE OF CONTENTS

- 1.0 Introduction
- 2.0 Objectives
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  - 3.1 The gastrointestinal system
  - 3.2 Health conditions of the gastrointestinal system
  - 3.3 Practical demonstration of procedure for the management of conditions of the gastrointestinal system
  - 3.4 Management approach for the identified health conditions
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor Marked Assignment
- 7.0 References and further readings

### 1.0 INTRODUCTION

In this unit, you will learn about the health condition affecting the gastrointestinal system. The primary functions of the organs in this system are movement of food, digestion, absorption, elimination and provision of a continuous supply of nutrients electrolytes and water.

Problem with the performance of any of these functions due to problems with the organs responsible will result in health conditions/diseases.

### 2.0 OBJECTIVES

At the end of this unit, you should be able to:

- Describe the gastrointestinal system
- Describe the health conditions of the gastrointestinal system.
- Describe the practical demonstration of procedure for the management of conditions of gastrointestinal system
- Explain the general approach to the management of identified conditions.

### 3.0 MAIN CONTENT

- 3.1 The organs of the digestive system are grouped into the alimentary canal (gastrointestinal tract {GI}) and the accessory organs of digestion.  
The alimentary canal is made up of the mouth, oesophagus, stomach, small and large intestine, while the accessory organs include the liver, pancreas gall bladder and the ductal system.



The Mouth - consists of lips and oral cavity. The oral cavity contains the teeth and the tongue. The salivary gland – an accessory organ is also located in the mouth.

The mouth is linked with the other parts of the alimentary tract by the pharynx.

The mouth provides entrance and initial processing for nutrients and sensory data such as taste, texture and temperature.

The teeth is used for mastication and the tongue assist in deglutition, taste sensation and mastication.

The salivary glands produce secretion containing ptyalin for starch digestion and mucus for lubrication.

The pharynx aids in swallowing and functions in ingestion by providing a route for food to pass from the mouth to the oesophagus.

The Oesophagus – is a muscular tube that receives food from the pharynx and propels it into the stomach by peristalsis.

The Stomach – is located on the left side of the abdominal cavity occupying the hypochondriac epigastric and umbilical regions. It stores and mixes food with gastric juices and mucus which produces chemical and mechanical changes in the bolus of food.

The secretion of digestive juices is stimulated by smelling, tasting and chewing food which is known as cephalic phase of digestion.

The gastric phase is stimulated by the presence of food in the stomach, regulated by normal stimulation via the parasympathetic nervous system (PNS) and hormonal stimulation through secretions of gastrin by the gastric mucosa.

After processing in the stomach, the food bolus called chyme is released into the small intestine through the duodenum.

Two sphincters control the rate of food passage

- Cardiac sphincter – located at the opening between the oesophagus and stomach.
- Pyloric sphincter – located between the stomach and duodenum.

Three anatomic divisions of the stomach are fundus, body and antrum

The gastric secretions are

Pepsinogen, hydrochloric acid, intrinsic factors and mucoid secretions

The Small Intestine

It is composed of the duodenum, jejunum and ileum.

It extends from the pylorus to the ileocecal valve which regulates the flow into the large intestine and prevents reflux into the small intestine. Major functions are digestion and absorption of the end products of digestion.

The structural features are

Villi – functional units of the small intestine

Crypts of lieberkuhn – produces secretions containing digestive enzymes

Brunner's glands – it is found in the sub mucosa of the duodenum and it secretes mucus.

Large Intestine

This is divided into four parts namely the Caecum (with appendix), Colon (ascending, transverse, descending, and sigmoid), rectum and anus. It serves as a reservoir for faecal material until defecation occurs. It also functions to absorb water and electrolytes.

Microorganisms present in the large intestine are responsible for a small amount of further breakdown and also make some vitamins.

- Amino acids are deaminated by bacteria resulting in ammonia which is converted to urea by the liver.

- Bacteria in the large intestine aid in the synthesis of vitamin K and some of the vitamin B group.

Faeces (solid waste) leave the body via the rectum and anus.

Anus contains internal sphincter (under involuntary control) and external sphincter (voluntary control).

Liver

This is the largest internal organ located in the right hypochondriac and epigastric regions of the abdomen.

The liver lobules which are composed of hepatic cells are the functional unit of the liver.

The functions of the liver include:

- Metabolism of fats, carbohydrates and proteins. It oxidizes these nutrients for energy and produces compounds that can be stored.
- Production of bile
- Conjugation and excretion (in the form of glycogen fatty acid, minerals, fat soluble and water soluble vitamins) of bilirubin.
- Stores vitamins A, D, E, K, B12 and iron
- Synthesis of coagulation factors
- Detoxification of many drugs and conjugation of sex hormones.
- Store glucose in form of glycogen
- Functions as the body's chemical factory. Several important protein found in the blood are produced in the liver.

Biliary System

Consist of the gall bladder and associated ductal system (bile ducts).

Gall bladder lies on the under surface of the liver and it functions to concentrate and store bile.

The ductal system provides a route for bile to reach the intestines.

Bile is formed in the liver and excreted into the hepatic duct.

Hepatic duct joins with the cystic duct (which drains the gall bladder) to form the common bile duct.

If the sphincter of Oddi is relaxed, bile enters the duodenum. If contracted, bile is stored in gall bladder.

Pancreas

It is positioned transversely in the upper abdominal cavity.

It consists of a head, body and tail along with a pancreatic duct, which extends along the gland and enters the duodenum via the common bile duct.

It has both exocrine and endocrine functions. As exocrine, the cells secrete trypsinogen and chymotrypsin for protein digestion; amylase to breakdown starch to disaccharides, and lipase for fat digestion.

The islets of Langerhans (Alpha & beta cells) are involved in endocrine function. Alpha cells produce glucagon while beta cells produce insulin.

Physiology of digestion and absorption

Digestion is the physical and chemical breakdown of food into absorptive substances. It is initiated in the mouth where food mixes with the saliva and starch is broken down. It then passes into the oesophagus where it is propelled into the stomach.

In the stomach, food is processed by gastric secretions into substances called chyme.

In the small intestines, carbohydrates are hydrolyzed to monosaccharides, fats to glycerol and fatty acids and protein to amino acids to complete the digestive process.

When chyme enters into the duodenum, mucus is secreted to neutralize hydrochloric acid. In response to release of secretion, pancreas releases bicarbonate to neutralize acid chyme.

Cholecystikinin and pancreozymin are also produced by the duodenal mucosa. It stimulates the contraction of the gall bladder along with the relaxation of the sphincter of oddi (to allow bile to flow from the common bile duct into the duodenum) and stimulate release of pancreatic enzymes.

### 3.2 The Health Conditions Include:

#### **I. Symptoms associated with disorders of the GI tract**

##### **i) Nausea and Vomiting**

Nausea is the feeling of discomfort in the epigastrium with a conscious desire to vomit. It occurs in association with and prior to vomiting.

Vomiting is the forceful ejection of stomach contents from the upper Gastro Intestinal (GI) tract. Emetic centre in the medulla is stimulated (e.g. by local irritation of the intestine or stomach or disturbances of equilibrium) causing vomiting reflex.

Nausea and vomiting are the two most common manifestations of GI disease.

Contributing Factors are

- Gastro intestinal disease/obstruction
- Central Nervous disorder e.g. meningitis, lesions of the Central Nervous System.
- Circulatory problems e.g. congestive heart failure
- Metabolic disorders e.g. uraemia
- Side effects of certain drugs
- Pain
- Psychic trauma
- Response to motion
- Early pregnancy

For a client with nausea and vomiting, there will be: weakness, fatigue, pallor, possible lethargy, dry mucus membrane and poor skin turgor/mobility especially if it is prolonged with dehydration

The condition will be managed using the standing orders, but the principle of management when the condition is not due acute abdomen for which the patient will definitely be referred urgently, is to

Give drugs that help control nausea and vomiting.

Give oral rehydration therapy, to be taken in sips.

Advice patient to eat bland foods in small amounts when able to tolerate foods

Avoid situations, foods or liquids that precipitate nausea and vomiting

##### **ii) Anorexia/Eating Disorders**

Anorexia nervosa – this is refusal to eat or aberration in eating patterns resulting in severe emaciation that can be life threatening.

It is characterized by fear of becoming fat and a body image disturbance where clients claim to feel fat even when extremely thin.

This disorder is most common in adolescent and young female adults.

The assessment findings for these disorders are:

- Weight loss of 15% or more of original body weight.
- Preoccupation with being thin and inability to recognize degree of own emaciation.
- History of high activity and achievement in academics or athletics.

Management

Monitor vital signs

Weigh 3 times / week

Do not comment on weight loss or gain. Determine patient's food likes and dislike. Encourage the removal of unpleasant stimulus.

Give drugs that will stimulate patient's appetite.

### **iii) Diarrhoea or dysentery**

This is increase in peristaltic motility, producing watery or loosely formed stools. Diarrhoea is a symptom of other pathologic process and not a disease. Diarrhoea can cause dehydration and death.

Dysentery (diarrhoea with blood and often mucus) is also a symptom – not a disease. It can cause dehydration, death and also anaemia and shock from blood loss

There will be abdominal colic, cramps/distension, foul – smelling watery stools, increased peristalsis, anorexia, thirst, tenesmus, and anxiety. In dysentery, there will be blood in stool. There may be no, some, moderate or severe dehydration, anaemia if dysentery. When there is dehydration, the patient will have sunken eyes, sunken fontanelle (only in children), dry mouth, cyanosis, hypotension and decreased elasticity of skin.

Causes include:

- Infections of the intestine by viruses, bacteria, amoebae, giardia and schistosoma
- Food poisoning
- Malabsorption problems, lactose intolerance
- Chronic infection – e.g. HIV infection
- Biliary tract disorders
- Use of saline laxatives
- Highly seasoned foods, or if there is change in diet,
- Stress
- Drugs – e.g. some antibiotics.

Management

Replacement of fluids either orally or intravenously (ORT or I/V fluids) according to the standing orders (children are managed using the IMCI chart)

Give antibiotics/anti-diarrhoea

Monitor and maintain fluid and electrolyte balance

### **iv) Constipation**

This a condition when there is lengthening of normal (for individual) time period between bowel movements.

There is passage of small volume of dry, hard stools, as a result of decreased motility of the colon or from retention of faeces in the colon or rectum.

Causes of constipation include:

- Inadequate bulk/liquid in the diet
- Lack of physical activity
- Prolonged use of constipating medications e.g. iron.

There will be feeling of abdominal fullness, pressure in rectum, abdominal distension, and increased flatus.

Constipation can usually be relieved by drinking adequate fluids; eating healthy foods such as fruits, vegetables, and cereals; and establishing routine evacuation habits. A high-fibre diet is particularly important for people who are taking medications that tend to harden stools and produce irregular bowel habits.

### **vi) Abdominal pain**

Almost all abdominal problems cause abdominal pain. There are two main types of abdominal pain namely intermittent (colic) and constant abdominal pain.

Abdominal pain is intermittent if it becomes severe for a short time and then gets better. The pain increases and decreases. And can continue for several hours or a few days. Patients with this type of abdominal pain find it difficult to sit still. The causes of this intermittent abdominal pain may include obstruction or inflammation of – the GI tract (stomach or small intestine or large intestine), or the female reproductive tract (tubes or uterus), or urinary tract (ureters)

Constant abdominal pain is the pain that does not go away and patient with such pain usually stay still. It is caused by – inflammation or swelling or stretching of the organ or peritoneum at the place of the pain. Note these four causes of constant abdominal pain thus – when it is all over it caused by pus in the peritoneum (peritonitis) or blood in the peritoneum (trauma or ectopic pregnancy); pain in any part is caused by spinal disease (fracture or tuberculous) with referred pain; pain in upper abdomen is caused by chest disease (pneumonia or pleurisy) with referred pain; pain from where rib joins spine to genitalia or upper, inner thigh – ureteric colic (stones)

## **II. Health disorders**

### **i) Gastritis**

This is an acute inflammatory condition that causes a breakdown of the normal gastric protective barriers with subsequent diffusion of hydrochloric acid into the gastric lumen. This results in haemorrhage, ulceration and adhesions of the gastric mucosa.

It may be caused by excessive ingestion of certain drugs (salicylates, steroids, butazolidin) alcohol, food poisoning, large quantities of spicy, irritating foods in diet.

Patient usually presents with anorexia, nausea and vomiting, epigastric fullness/discomfort and epigastric tenderness.

### **ii) Peptic Ulcers**

this refers to the ulceration of the mucosa lining of the distal oesophagus, stomach or small intestine (duodenum or jejunum). There are two types

#### **- Gastric Ulcers**

This is the ulceration of the mucosa lining of the stomach. Most commonly found in the antrum. Pre disposing factors include smoking, alcohol abuse, emotional tension and drugs. It may be caused by bacterial infection.

Signs and Symptoms

Pain located in left epigastrium with possible radiation to the back, usually occurs 1 – 2 hours after meals

Weight loss

#### **- Duodenal Ulcers**

Ulceration of the mucosa lining of the small intestine, most commonly found in the first 2cm of the duodenum. It is more common than gastric ulcers predisposing factors include psychological stress, smoking, alcohol abuse, bacterial infection.

Signs and Symptoms

Loss of appetite

Pain located in midepigastrium and described as burning, cramping, usually occurs 2 -4 hours after meals and is relieved by food.

### **iii) Hernias**

This is the protrusion of viscus through the wall of the containing cavity.

Areas of the body where it may occur are the umbilical area, inguinal area, diaphragm, femoral ring and at the site of an incision.

Hernias are categorized as:

- Reducible – when it can be returned to its normal position
- Irreducible – when it cannot be returned to its normal position.
- Incarcerated – when there is obstruction of intestinal flow.
- Strangulated – when blood supply is cut off.

Causes

Weakness in the containing wall which may be congenital, related to straining or the aging process, or trauma

Increased intra-abdominal pressure (obesity or pregnancy)

Signs and Symptoms

Protrusion of a structure without symptoms

Appearance of protrusion when straining or lifting in certain instances there may be pain. If the intestine is obstructed, there may be distension, pain, nausea and vomiting

### **iv) Intestinal Obstructions**

- Mechanical intestinal obstruction is physical blockage of the passage of intestinal contents with subsequent distension by fluid, gas. This condition may be caused by adhesions, hernias, volvulus, intussusceptions, inflammatory bowel disease, foreign bodies, strictures neoplasms and faecal impaction.
- Paralytic ileus – interference with the nerve supply to the intestine resulting in decreased or absent peristalsis caused by abdominal surgery, peritonitis, shock, spinal cord injuries.
- Vascular obstruction – interference with the blood supply to a portion of the intestine resulting in ischemia and gangrene of the bowel caused by an embolus, atherosclerosis.

Signs and Symptoms

Small intestinal obstruction – (non faecal) vomiting, colicky intermittent abdominal pain

Large intestine obstruction – cramp like abdominal pain, occasional faecal type vomitus.

Client will be unable to pass stools or flatus.

Abdominal distension

Rigidity

High pitched bowel sounds above the level of the obstruction and decreased or absent bowel sounds distal to obstruction.

### **v) Appendicitis**

This is the inflammation of the appendix that prevents mucus from passing into the caecum.

If untreated, ischemia, gangrene, rupture and peritonitis occur

Signs and Symptoms

Diffuse pain, localized in the lower right quadrant

Nausea and vomiting

Guarding of abdomen, rebound tenderness

Decreased bowel sounds

Fever

#### **vi) Haemorrhoids**

This is the congestion and dilatation of the veins of rectal and anal area. It usually results from impairment of flow of blood through the venous plexus.

It may be internal (above the anal sphincter) or external (outside the anal sphincter)

Predisposing Conditions include:

Occupations requiring long periods of standing and sitting

Increased intra-abdominal pressure caused by prolonged constipation, pregnancy, heavy lifting, straining at defecation.

Signs and Symptoms

Bleeding with defecation, hard stools with streaks of blood

Pain with defecation, sitting or walking

Protrusion of external haemorrhoids upon inspection

#### 4.0 CONCLUSION

In this unit, you learnt that the organs of the digestive system are grouped in the alimentary canal (GI tract) and the primary functions are movement of food, digestion absorption, elimination and provision of a continuous supply of nutrients electrolytes and water. The health conditions could result if there is problem with ingestion and movement of food, digestion and absorption of nutrients as well elimination of waste materials. The health problems result from different causes which include inflammations, infections, congenital malformations, degeneration, and obstructions. Some of the conditions have been discussed and their management highlighted. We will continue with other conditions in the next unit.

#### 5.0 SUMMARY

In summary, health conditions of the gastrointestinal system are those affecting the mouth, oesophagus, stomach, small and large intestines, liver, gall bladder and the pancreas. The main aim of management is to ensure maintenance of adequate nutritional status, establishment of regular bowel habits as well as avoid as much as possible factors that could precipitate these health condition

#### 6.0 TUTOR MARKED ASSIGNMENT

Differentiate between duodenal and gastric ulcers

#### 7.0 REFERENCE AND FURTHER READING

- Anthony, C. P. & Thibodeau, G. A. (1998) Basic concept in anatomy and physiology (8th ed.). St. Louis: Mosby.
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## UNIT 7: HEALTH CONDITIONS OF THE GASTROINTESTINAL SYSTEM II

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
  - 3.1 The health conditions of the gastrointestinal system
  - 3.2 History and examination performed on the gastrointestinal system
  - 3.3 Management approach for the identified health conditions
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor Marked Assignment
- 7.0 References and further readings

### 1.0 INTRODUCTION

In this unit, we will continue on the health conditions affecting the gastrointestinal system which was started in the last unit. You will recall that the primary functions of the organs in this system are movement of food, digestion, absorption, elimination and provision of a continuous supply of nutrients electrolytes and water.

Problem with the performance of any of these functions due to problems with the organs responsible will result in health conditions/diseases.

### 2.0 OBJECTIVES

At the end of this unit, you should be able to:

- Describe the health conditions of the gastrointestinal system
- Highlight the history and examination performed on the gastrointestinal system
- Explain the general approach to the management of identified conditions.

### 3.0 MAIN CONTENT

#### 3.1 **Health conditions**

##### **Gastroenteritis**

Gastroenteritis or acute diarrhoea disease is inflammation of the stomach and the intestines, with vomiting and diarrhoea, usually as a result of bacterial or viral infection. It is diagnosed when there is

Diarrhoea

Abdominal pain of bowel (intestinal) colic type (usually). Constant abdominal pain is not usually caused by gastroenteritis

Vomiting (usually)

Fever in some cases

Specific diarrhoeal diseases include

- Cholera caused by vibriocholerae
- Amoebiasis
- Bacillary dysentery
- Typhoid
- Salmonella food poisoning

Causes include

Food poisoning – which can result from consuming poisonous foods especially fish and certain plants, poisons or chemicals in food, toxins in food or certain organisms.

Infection of the intestine with

- Viruses (especially rota virus),
- Unusual types of normal intestinal bacteria e.g. Escherichia coli, special bacteria such as Shigella, Salmonellae, Clostridia and vibrio cholerae
- Amoebic dysentery organisms
- Parasitic worms

Other causes include: acute or chronic infection of other parts of the body, malnutrition, malabsorption, change in diet and anxiety.

Signs and symptoms

Frequent watery stools

In dysentery there will be blood and mucus in the stool with colicky abdominal pain

In cholera there will be cramps in the abdomen and limb muscles

Vomiting – this is not always present, but it can be frequent

Signs of dehydration – these develop if a large volume of fluid is lost and not quickly replaced. They include

- decreased elasticity of the skin
- sunken fontanelle (in children)
- sunken eyes
- dry mouth
- fast pulse
- low blood pressure
- cyanosis
- fever

### **Parasitic Worms**

A parasite is an organism that lives in, on or at the expense of the host.

Common human GI parasites are round worms, hookworm, threadworm, whipworm, strongyloides and tapeworm.

- Roundworm – they live inside the tube of the small intestine. Usually there are no symptoms and signs but if there are many worms, there will be abdominal discomfort or mild colic and distension. In severe cases, there can be intestinal obstruction.
- Hookworm – they live in the upper small intestine attached by their mouths to the intestinal wall. They suck blood and protein from the intestinal wall. Symptoms and signs include anaemia with weakness, tiredness, dizziness. Anaemia is the only common and important result of hookworm.
- Threadworm – threadworm is very common especially in children. They live in the large intestine. The fertilized female comes through the anus at night and lays eggs on the skin around the anus. This causes itching and scratching.

- Whipworm – lives in the mucosa of the large intestine and may cause gastrointestinal symptoms and signs, but only if they are present in large number and even then usually only in children. These include diarrhoea with blood, prolapsed of the rectum and anaemia
- Strongyloides – this is a very small worm that lives in the upper small intestine but can spread through the whole gastrointestinal tract and also sometimes through it to other parts of the body. Symptoms may include abdominal discomfort, diarrhoea, and failure to absorb food, allergic type of skin rashes and an unusual rash with an inflamed line in the skin which disappears after a few hours.
- Tapeworm – the adult taenia live in the gastrointestinal tract of man and is diagnosed usually when a part of the worm forces itself out of the anus or he sees part of the worm wriggling in the stool.

### **Mouth disorders**

The most common ailment of the mouth is tooth decay. Other disorders affecting the mouth include gingivitis, a condition marked by inflamed, infected gums; trench mouth, a severe form of gingivitis that causes bleeding ulcers in the mouth; and thrush, a fungal infection characterized by white sores in the mouth. Oral cancer is a risk for individuals who smoke or chew tobacco or who drink alcohol excessively. A small lump or thickened tissue in the mouth may indicate cancer. It should be checked by a doctor or dentist without delay, as many oral cancers can be cured if treated early

If mouth disorders, symptoms may include

Dental caries, bleeding gums, dryness or increased salivation, odours,

For babies there may be difficulty in chewing, facial abnormality, and difficulty in sucking.

### **Disorders of the throat**

Throat pain – this can be caused by tonsillitis (infection of the tonsils), epiglottitis (infection of the epiglottis), and diphtheria (infection caused by diphtheria bacteria).

The patient with throat pain may have difficulty in swallowing (dysphagia), the throat is more red than usual and white or grey areas on the tonsils.

If the patient is not able to drink, diagnose epiglottitis, if the throat is more red than usual but there are no areas of white on the tonsils, diagnose tonsillitis caused by a virus. If the throat is very red and there are areas of white only in the cracks of the tonsils, diagnose tonsillitis caused by bacteria and if there is white or grey areas which cover the tonsils but the throat is slightly red, diagnose diphtheria.

### **Disorders of the liver**

- Jaundice is a condition in which there is yellowing of the skin, conjunctivae, and mucous membranes caused by excessive amounts of bile pigments in blood tissues

These pigments, normally present in blood as a result of the breakdown of haemoglobin in red blood cells, are filtered through the liver and excreted in faeces.

Excessive amounts of these pigments produce four types of jaundice.

- In haemolytic jaundice there is increased production of bile pigment because of red blood-cell damage. This damage can be caused by antibodies created by a mismatched blood transfusion. In infants the antibodies can be caused by prenatal mismatch between the Rh factor in the infant's blood and that of the mother.

- New-borns can also be jaundiced as a consequence of the condition known as hyperbilirubinemia. In these cases, there is a temporary defect in synthesis of the enzyme that breaks down bile to an excretable form.
- Hepatocellular jaundice occurs when liver cells are damaged either by viruses, or by excessive intake of alcohol, and lose the ability to process pigment.
- Obstructive jaundice follows physical obstruction of the ducts that transport pigment from the liver to the intestine. Blockage can be due to gallstones, tumour, or inflammation.

#### - Hepatitis

Wide spread inflammation of the liver tissue due to hepatic cell degeneration and necrosis. Inflammation of the periportal areas (may cause interruption of bile flow)

Hepatitis A – is transmitted by faecal/oral route, often occurs in crowded living conditions with poor personal hygiene or from contaminated food, milk, water or shell fish.

Hepatitis B – it is transmitted by blood and body fluids, often from contaminated needles among IV drug abusers.

Signs and symptoms

The presentation will depend on the stage of infection.

- Pre icteric stage  
Anorexia, nausea and vomiting, fatigue, constipation or diarrhoea, weight loss, mild fever, malaise  
Right upper quadrant discomfort, hepatomegaly, splenomegaly and lymphadenopathy.
- Icteric stage  
Fatigue, weight loss, light coloured stools, dark urine continued hepatomegaly with tenderness, lymphadenopathy and splenomegaly.  
Jaundice, pruritus
- Post Icteric Stage  
Fatigue but an increased sense of well-being hepatomegaly gradually decreasing

#### - Cirrhosis of the liver

Chronic, progressive disease characterized by inflammation fibrosis and degeneration of the liver parenchymal cells. Destroyed liver cells are replaced by scar tissue resulting in malfunctioning of the liver.

Signs and Symptoms

Fatigue anorexia, nausea and vomiting, indigestion, weight loss, flatulence and irregular bowel habits. In the early stages, there is hepatomegaly with pain located in the right upper quadrant.

Later there is atrophy of the liver – the liver is hard upon palpation.

There is increased abdominal girth, changes in mood, alertness and mental ability. There is sensory deficit, decreased axillary and pubic hair in males, amenorrhoea in young females. Jaundice of the skin sclera and mucous membranes with pruritus.

#### **Congenital Disorders**

- Cleft lip and palate – Non-union of the tissue and bone of the upper lip and hard and soft palate during embryonic development

With cleft palate, the failure of the bone and tissue to fuse result in a communication between the mouth and nose.

Signs and Symptoms includes – facial abnormality visible at birth,

Difficulty in sucking – inability to form airtight seal around the nipple

- Imperforate Anus

Rectal pouch ends blindly at a distance above the anus. There is no anal opening.

Symptom: - No stool in the first 24 hours after birth. Rectal thermometer cannot be inserted.

### 3.2 Practical demonstration of procedure for the management of conditions of gastrointestinal system

ascertain the client's age and locate the appropriate section

look up the client's condition under the table of content of the section which could be abdominal problems (including hernias) anal problems, worm infestations, diarrhoea or vomiting and turn to the appropriate page.

The next step is to carry out detailed history taking by asking the client the following questions

- What the problem is, the onset - when the problem started, the cause and how it started
- Is there fever?
- Any pain in the mouth, or salivary gland?
- Is there chest pain which is usually worsened with swallowing or lying down?
- Any change in appetite?
- Is there vomiting? Any haematemesis?
- Are your bowels alright? Is there diarrhoea? Any dysentery?
- Do you have problem when passing urine?
- Is there abdominal pain? If so, is the abdominal pain in the epigastric and related to food (made worse or eased by food)? (usually caused by stomach or duodenal disease) Or is it colic in epigastrium and around umbilicus? (usually caused by inflammation of or obstruction of the small intestine) Or is it colic in the side or lower part of the abdomen and around umbilicus? (usually caused by inflammation of or obstruction of the large intestine) Or is the abdominal pain constant or intermittent in any area? (usually caused by inflammation or stretching of the peritoneum in that area)
- Any weight loss?  
Problems with ingestion, ask about the following symptoms:
- Changes in appetite, anorexia or hyperorexia. Note food preferences / dislikes.
- Food intolerances – allergies, fluid and fatty foods, weight gain/loss – note situations that might interfere with appetite (stress, deliberate weight reduction, dental problems) note average weight gain or loss within the past 2 – 9 months
- Dysphagia – (difficulty in swallowing) note level of sensation where problem occurs, whether it occurs with food/fluids.
- Nausea – note onset and duration, existence of associated symptoms (weakness, headache, vomiting) and whether it occurs before or after meals.
- Vomiting – note onset, and duration foods/fluid that can be maintained, associated symptoms (fever, diarrhoea)
- Regurgitation (reflux) note whether it occurs with ingestion of certain foods, any associated symptoms (vomiting) occurrence with certain positions (supine, recumbent). Ask about symptoms associated with digestion/absorption.
- Dyspepsia (indigestion) note location of discomfort whether associated with certain foods; time of day/night of occurrence, associated symptoms (vomiting)
- Heart burn – note location, whether pain radiates whether it occurs before or after meals, time of day when the discomfort is most noticeable, food that aggravate or eliminate symptoms.

- Pain – character, frequency, location, duration distribution, aggravating or alleviating factors. Ask about symptoms associated with bowel habits
- Constipation – note number of stools in a day or week, changes in size or colour of stool, alterations in food/fluid intake, presence of tenesmus, painful defecation, associated symptoms (abdominal pain, cramps)
- Diarrhoea – note number of stools/day, consistency, quantity, odour, associated symptoms (nausea, vomiting, flatus, and abdominal distension).
- Hepatic / biliary problems – symptoms may include:
  - Jaundice – location, duration, notable increase/decrease in degree
  - Pruritis – note location distribution, onset
- Urine changes – note colour, onset, notable increase or decrease colour change, associated symptoms (pain)
- Clay colour stools – note onset, number/day associated symptoms (pain) problems with ingestion/digestion)
- Increased bleeding – note bleeding gum, haematuria.
- Ask about life style – eating behaviours (rapid ingestion, skipping meals, snacking) cultural / religious values ingestion of alcohol, smoking.
- Use of medications – note use of antacids, antiemetics, antiflatulents, vitamin supplements, aspirin and anti-inflammatory agents.
- Past medical history – childhood, adulthood, psychiatric illness, surgery, bleeding disorders, menstrual history, exposure to infectious agents, allergies.

The response of the client to the above is recorded on the treatment card.

You will now perform detailed examination thus, to assess the condition and be able to make clinical judgement that will lead you to the appropriate action from the standing orders.

- General appearance – check if ill looking or lethargic or unconscious or restless or irritable or in pain. Check if there is any wasting, dehydration or malnutrition.
- Temperature, Pulse, Respiration and Blood Pressure – check and record (temperature is raised if there is infection, there is fast pulse and low blood pressure when patient is in shock)
- Eyes – normal, sunken or very sunken and dry, note if tears absent or present. Check conjunctiva for pallor
- Mouth - Inspect/palpate
  - Outer/inner lips: colour, texture, moisture.
  - Buccal mucosa: colour, texture, lesion, ulcerations
  - Teeth/gums: level of dentition, missing teeth, cavities, tenderness, swelling, presence of dental caries.
  - Tongue: protrusion without deviation, texture, colour, moisture
  - Palates: (hard and soft) colour
- Neck – for enlarged and tender lymph nodes
- Throat – for redness, purulent discharge and enlarged and coated tonsils
- Abdominal examination (see figure I on areas of the abdomen)
  - i) Inspection – size, shape, surface of scar, movement when breathing or any visible intestinal movement, or any distension
    - Inspect skin – colour, scars, striae, pigmentation, lesions, vascularity
    - Inspect contour, symmetry, distension, and umbilicus
    - Inspect movement of peristalsis, pulsation

ii) Palpation –

Palpate the abdomen to discover three things namely – tenderness, rebound tenderness, guarding and rigidity; whether normal organs are enlarged - liver, spleen, uterus and bladder; to know if there are masses or lumps in other places including hernias and lymph glands.

Palpate of each of the four areas of the abdomen. First press lightly into each of the four areas, then press more deeply into each of these areas.

Look at the patient's face to see if the pain becomes worse when you press. Feel for any unusual swelling.

If the pain becomes worse when you press into the abdomen, look for guarding and rebound tenderness: -

Press slowly and deeply into the abdomen, if the patient has guarding, the muscles will stop you from examining deeply. Guarding is when the muscles at the front of the abdomen become hard to protect the abdomen from more pain.

Press slowly and deeply into the abdomen. Suddenly remove your hand. If the patient has rebound tenderness, the pain will suddenly become worse.

Observe the patient's face.

Look for enlarged spleen. Start at area 7. Press your hand into the abdomen.

Move a little towards area 2 and press the abdomen again. Do this again and again. If the patient has enlarged spleen, you will feel the hard edge of the spleen before you feel the edge of the ribs

Look for enlarged liver. Start at area 10. Press your hand into the abdomen. Move your hand a little towards area 11. Press the abdomen again. Do this again and again. If the patient has enlarged liver, you will feel the hard edge of the liver before you feel the edge of the ribs. The liver may also be tender if the patient has hepatitis.

Look for painful kidneys. Put your left hand behind area 3 and your right hand on area 3. Press your right hand into the abdomen. If the patient has painful kidneys, the pain will increase when you press. Do the same for area 9.

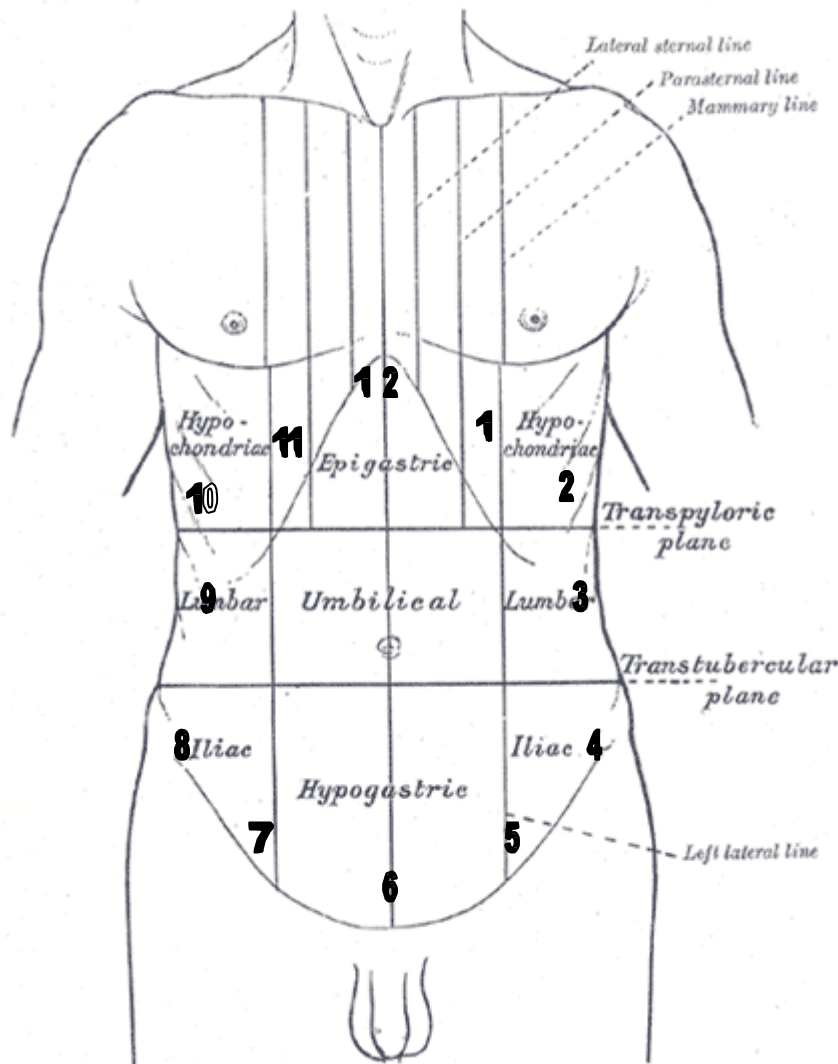
iii) Percussion – (if necessary) Percuss for tenderness/masses, organs, or fluid (ascites)

iv) Auscultation – (if necessary) of bowel sounds whether normal, increased or absent. Normal – bubbling, gurgling 5 – 30 times/minutes. Increase may indicate diarrhoea, gastroenteritis or early intestinal obstruction.

Decrease – may indicate constipation, late intestinal obstruction.

- Check for the presence of hernia – umbilical, inguinal, scrotal
- Hydration status – fontanelle, eyes, mouth, tongue, skin, Mouth and tongue – check if moist, dry or very dry and note if he drinks normally, eagerly or poorly.
- Anus – any prolapse, fissures or redness
- Blood – Haemoglobin level, (estimate and record)
- Urine - MCS
- Stool – MCS
- Weight

Areas of the Abdomen  
0



3.3. Management of the identified health conditions

From the history and examination performed assemble the relevant findings, make a clinical judgement and locate the appropriate action in your standing orders. However, the procedure for the management of some of the identified health conditions are as follows:

Gastritis

Give antiemetic, antacids and sedatives.

Monitor and maintain fluid and electrolyte balances.

Counsel client concerning avoidance of foods such as coffee, spicy foods, alcohol, and drugs like salicylates, ibuprofen and steroids. If no improvement refer

Peptic Ulcer

Drug therapy – antacids available at all times.

Proper diet – bland diet consisting of six small meals/day. Eat meals slowly.

Avoid acid producing substances like caffeine, alcohol, tea or cola drinks and highly seasoned foods. Must also avoid smoking and aspirin or codeine compound drugs

Avoid stressful situations at meal time



Plan for rest period after meals

Avoid late bedtime snacks

Avoid stress – producing situation and develop stress – reducing methods.

Hernias

All hernias are managed by surgery to repair and suture the defect.

Patients with hernias should be referred for surgery.

Intestinal Obstructions

This is a surgical emergency. Patients with intestinal obstructions should be referred urgently for surgery.

Haemorrhoids

Symptomatic relief in mild cases

- Topical medication to shrink the mucous membrane
- Stool softeners and laxatives to keep stool soft and avoid straining
- Sitz baths to relieve pain
- High fibre diet to keep stool soft.
- Encourage increased fluid intake
- Avoidance of constipation, prolonged sitting or standing
- Refer severe cases for operation

Hepatitis – routine immunization

Patient who had suffered the infection should refrain from donating blood

In cholera epidemic – immunization, notify the appropriate authority

Generally for disorders of GI tract

Maintain personal hygiene

Avoid exposure of people to infection

Regular deworming of children

Maintain personal, environmental and food hygiene

Provision of potable water

#### 4.0 CONCLUSION

In this unit, we completed the health conditions of the alimentary canal (GI tract)

The health problems result from different causes which include inflammations, infections, congenital malformations, degeneration, and obstructions.

The management will depend on the cause of the disorder. However, modification in dietary habit and life style are necessary to alter the progression of gastro intestinal illnesses.

#### 5.0 SUMMARY

In summary, health conditions of the gastrointestinal system discussed are those affecting the mouth, stomach, small and large intestines, liver, and gall bladder. The general prophylaxis for the conditions of GI tract include maintenance of personal environmental and food hygiene, provision of potable water supply, and regular deworming of children.

#### 6.0 TUTOR MARKED ASSIGNMENT

Highlight the symptoms that are common to the disorders of the gastro intestinal disorders.

What are the possible risk factors of the disorder?

## 7.0 REFERENCE AND FURTHER READING

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## UNIT 8: HEALTH CONDITIONS OF THE RESPIRATORY SYSTEM

### TABLE OF CONTENT

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
  - 3.1 Brief anatomy and physiology of the respiratory system
  - 3.2 Health conditions of the Respiratory System
  - 3.3 History and examination for Respiratory System
  - 3.4 Management approach for the health conditions
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor Marked Assignment
- 7.0 References and further readings

### 1.0 INTRODUCTION

The Respiratory System is the system of organs in the body responsible for the intake of oxygen and the expiration of carbon dioxide. It consists of the lungs, bronchi, bronchioles, trachea, diaphragm, and nerve supply. They are organs that deliver oxygen to the circulatory system for transport to all body cells. Oxygen is essential for cells, which use this vital substance to liberate the energy needed for cellular activities. In addition to supplying oxygen, the respiratory system aids in removing of carbon dioxide, preventing the lethal build-up of this waste product in body tissues. Day-in and day-out, without the prompt of conscious thought, the respiratory system carries out its life-sustaining activities. If the respiratory system's tasks are interrupted for more than a few minutes, serious, irreversible damage to tissues occurs, followed by the failure of all body systems, and ultimately, death. In this unit the procedures for the management of disease conditions of the respiratory system will be discussed.

### 2.0 OBJECTIVES

By the end of this unit, you will be able to

- Explain the anatomy and physiology of the respiratory system
- Describe the health conditions of the respiratory system
- State the detailed history and examination that are performed
- Explain the general approach to the management of such conditions

### 3.0 MAIN CONTENT

#### 3.1 Brief anatomy and physiology of the respiratory system

The respiratory system is in two parts – the upper respiratory tract and the lower respiratory tract

Organs of the upper respiratory tract include nose, pharynx – (divided into 3 sections viz nasopharynx, oropharynx and laryngopharynx) and the larynx. The work of the upper respiratory tract includes taking air to and from the lower respiratory tract; warming, moistening, filtering and purifying the air; it takes part in speech and hearing.

The organs of the lower respiratory tract are the trachea, bronchi, the bronchioles and the lungs.

Air is taken to the lungs by air passages. It enters the mouth or nose, goes through the larynx then down the trachea, which divides into two main bronchi. Each main bronchus divides into smaller bronchi known as bronchioles. The bronchioles divide and end in little air sacs known as alveoli.

The lungs are inside the chest – one on each side. They are separated by the heart and the other structures of the mediastinum. The right lungs consist of three lobes (upper, middle and lower lobes) and the left lung consist of two lobes (upper and lower lobes). Each lobe has one bronchus bringing air to and from it. Each lung is surrounded by a thin but air tight membrane called the pleura. The pleura surrounding and fastened to each lung is in turn surrounded by another pleura which is inside of and fastened to the chest wall and the mediastinum. The two layers are not fastened to each other and so can easily move over each other. There is normally nothing except a thin layer of slippery fluid

Taking air in and out of the respiratory is called ventilation, while exchanging the oxygen and carbon dioxide is called respiration.

Breathing is done by the muscles of the chest wall and the diaphragm. During breathing in, the muscles pull the rib cage outwards and upwards and the diaphragm downwards. When the chest wall (with the outer layer of pleura) moves away, the lungs (with the inner layer of pleura) follow, the lungs expand. The lungs expand because a negative pressure (or vacuum) is developed between the pleura lining the inside of the chest wall and the pleura lining the outside of the lungs when the chest and diaphragm start to move away from the lungs. During breathing out, the muscles relax and the lungs which are somewhat elastic and stretched contract and pull the chest wall and the diaphragm with them again because of the negative pressure between the pleura of the lungs and the pleura of the chest wall.

A system of blood vessels goes through the lungs. The pulmonary artery takes blood pumped by the right side of the heart. This blood is rather low in oxygen and high in carbon dioxide. The exchange of carbon dioxide and oxygen occur between the blood in the capillaries and air in the alveoli. The blood in them is taken back to the left side of the heart by the pulmonary vein. The left over air with high carbon dioxide content and low oxygen content is breathed out of the lungs while fresh air with high oxygen and low carbon dioxide is breathed into the lungs.

### 3.2 Health conditions of the Respiratory System

All the cells of the body are dependent on adequate oxygenation and removal of carbon-dioxide for health. This is otherwise known as respiratory. The group of organs that perform this function is the respiratory system and they include nose, pharynx, trachea, bronchi and the lungs.

The following terms are used to describe respirations

- Bradypnoea – slow respirations
- Cheyne stokes – periods of apnoea alternating with rapid respiration
- DOE – dyspnoea on exertion
- Dyspnoea – difficult laboured breathing may be subjective or objective.

- Orthopnoea – difficult breathing in a supine position relieved by sitting up.
- Paroxysmal nocturnal dyspnoea – transient episodes of acute dyspnoea that occur a few hours after falling asleep.
- SOB – short of breath
- Tachypnoea – rapid respirations or abnormality fast rate of breathing.
- Wheeze – sound as air moves out through bronchi and bronchioles that have been narrowed by spasm, swelling and secretions.
- Haemoptysis – expectoration of bloody sputum
- Rales – abnormal inspiratory or expiratory lung sound. Usually associated with presence of fluid
- Rhonchi – abnormal inspiratory or expiratory lung sound, usually associated with airway constriction.

Most episodes of acute illness in young children involve the respiratory system due to exposure to infection and a general lack of immunity. The disorders of the respiratory tract are as follows:

### **Acute Respiration Infection (ARI)**

Acute respiration infection is classified based on the site as Acute Upper Respiratory Infections (AURIs) Acute lower respiratory infection (ALRI).

Acute upper respiratory infections are those which involve the nose, sinuses, pharynx or larynx. The population at risk for developing a fatal respiratory disease are the very young, the elderly and the immune compromised.

While upper respiratory infections (URIs) are very frequent but seldom life threatening, lower respiratory infections (LRIs) are responsible for more severe illness such as influenza, pneumonia, tuberculosis and bronchiolitis.

Symptoms and signs of AURI

Nasal discharge with clear fluid, pus or blood

Pain in the face or forehead (over paranasal sinuses)

Cough

Symptoms and signs of ALRI

Cough with sputum that may be white or jelly like mucus, yellow, green or brown

Haemoptysis

Pain in the chest – tracheal (in front of the neck or centre of the chest present only on coughing; pleural (at the side of the chest more on breathing or coughing)

Shortness of breath

Wheezing

**Influenza** – also known as ‘flu’ is a contagious infection primarily of the respiratory transmitted from one person to another in droplets coughed or sneezed into the air. It is characterized by cold like symptoms plus chills, fever, headaches, muscle aches and fatigue.

Signs and Symptoms

Influenza is an acute disease with a rapid onset and pronounced symptoms.

After the influenza virus invades a person’s body, an incubation period of one to two days passes before symptoms appear.

Classic symptoms include sore throat, dry cough, stuffed or running nose, chills, fever with very high temperature, aching muscles and joints, headaches, loss of appetite, occasional nausea and vomiting and fatigue.

For most people, flu symptoms begin to subside after two or three days and disappear in seven to ten days. However, coughing and fatigue may persist for two or more weeks.

**Sinusitis** – inflammation of the mucous membrane of one or more of the sinuses located around the nose.

Normally the sinuses are filled with air and communicating with the nasal cavity. It produces more than 500ml of fluid secretions per day from the mucous membrane that lines them.

The Para-nasal sinuses include the frontal sinuses in the forehead, the ethmoid sinuses between the nose and the eyes; the sphenoid sinuses behind the eyes and the maxillary sinuses under the eye sockets.

Common colds may progress to sinusitis.

It could also occur if contaminated water is introduced into the sinuses.

The infection causes the lining of the sinuses to swell. This swelling traps the secretion which leads to increased bacteria in the mucus.

Signs and symptoms

- Dull aching pain sometimes described as heaviness or pressure. The pain occurs in different parts of the head and face depending on which sinuses are affected.
- Pain in the forehead and cheek with occasional numbness in the teeth which is caused by infection in the maxillary sinus.

The ethmoid sinus is associated with pain behind and between the eyes across the nose.

Pain around the eyes and the forehead is due to infection in the frontal sinus

Nasal secretions possibly purulent

Elevation of temperature

### **Common cold**

It is viral infection of the upper respiratory system including the nose, throat, sinuses, Eustachian tubes, trachea, larynx and bronchial tubes. Majority are caused by a group of viruses known as rhinoviruses. Almost all cold clear up in less than two weeks without complications.

Colds are the most common illness to strike any part of the body. It is estimated that the average person has more than 50 colds during a life time. Anyone can get a cold although pre-school and grade school children catch them more frequently than adolescents and adults. Repeated exposure to viruses causing cold creates partial immunity.

Although most colds resolve on their own, without complications, they are leading cause to visit the health centre, and of time lost from work and school.

Certain conditions that may lead to increased susceptibility include:-

- Fatigue and overwork
- Emotional stress
- Poor nutrition
- Smoking
- Living or working in crowded conditions

Cold makes the upper respiratory system less resistant to bacterial infection.

Signs and symptoms

Cough sore throat, running nose, nasal congestion, headache, low grade fever, and watery eyes.

### Mode of transmission

People with colds are contagious during the first two or four days of the infection. Colds pass from person to person in several ways. When an infected person coughs, sneezes or speaks, tiny fluid droplets containing the virus are expelled. If these are breathed in by other people, the virus may establish itself in their noses and airways.

Colds may also be passed through direct contact. If a person with cold touches his running nose, or watery eyes then shakes hands with another person some of the virus is transferred to the uninfected person. If the person then touches his mouth, nose or eyes, the virus is transferred to an environment where it can reproduce and cause a cold.

### **Epistaxis (Nose bleed)** – Bleeding from the nose

A number of different factors can cause bleeding from the nose. Frequently nose bleeds occur because of minor irritation or injury to the small veins in the septum i.e. the partition that divides the two sides of the nose. These veins may rupture spontaneously or the rupture may be caused by a sneeze or cough that raises the blood pressure inside the vein of the nose.

Generally nose bleeds are not serious and stop in a short time. Occasionally, they may be caused by more serious underlying diseases such as uncontrolled high blood pressure, infection, tumours of the nose, certain cancers such as leukaemia, or disease of the blood vessels themselves.

A nose bleed that does not readily stop by itself may be treated by applying pressure over the site of the bleeding. Alternatively, a cold compress will often help.

### **Pneumonia**

Pneumonia refers to inflammation of one or both lungs. In this condition, the alveolar spaces of the lungs are filled with fluid preventing oxygen from reaching blood cells and nourishing the other cells of body.

The various types of pneumonia are classified according to the offending organism or the organ involved.

Sometimes the inflammation occurs in scattered patches in the tissues around the ends of the bronchioles which are the smallest air tubes in the lungs. This is known as bronchopneumonia. In other cases the inflammation is wide spread and involves an entire lobe of the lung. This condition is called lobar pneumonia. It could be caused by bacteria or viruses.

#### Signs and symptoms

Cough with greenish to rusty coloured sputum (from blood).

Shortness of breath

Rapid, shallow respiration with an expiration grunt sometimes irregular due to pain,

Respiratory distress with nasal flaring,

Intercostal rib retraction

Use of accessory muscle of respiration

High pitched bronchial breath sounds

Decreased breath sounds

Crackles or crepitations

On tapping the chest (percussion) a dull flat sound is produced.

There is fever and chills,

Pleuritic chest pain – pain at the side of the chest, but occasionally in the shoulder or in the upper abdomen; It is worse when the chest moves e.g. on deep breathing or coughing. It is relieved by holding the chest still, for example by holding or lying on the painful side. Patient can often point to the place where the pleuritic pain is.

Weakness and general malaise

Tachycardia, cyanosis, profuse perspiration and abdominal distension

## **Pulmonary Tuberculosis (TB)**

This is chronic progressive infection caused by *Mycobacterium tuberculosis* via air borne droplets when infected persons cough, sneeze or laugh.

Once inhaled, the organisms implant themselves in the lungs. The alveoli are inflamed and small nodules are produced called primary tubercles, which later becomes fibrosed and the area becomes calcified.

Infection is spread via the lymph and circulatory systems.

### **Signs and Symptoms**

- Chronic cough – the cough stays and does go away even after treatment with antibiotics. Sputum usually made of pus
- Shortness of breath, Dyspnoea
- Haemoptysis
- Rales or crackles breathe sounds
- Anorexia
- Malaise – patient is early fatigued
- Weight loss
- Chest pain
- Afternoon low grade fever and night sweats
- Pallor

## **Asthma**

This is disorder of the respiratory system in which the passages that enable air to pass in and out of the lungs periodically narrow which obstructs the airflow. It enters and it is trapped. There is characteristic wheeze as the particular attempts to exhale through narrowed bronchi.

Breathing is laboured, coughing is attempted, but there is failure to expectorate satisfactory amounts which leads to anxiety.

The narrowing is typically temporary and reversible. Attacks may last between 30 to 60 minutes often with normal breathing between attacks. If attacks is difficult to control and is resistant to all forms of treatment, it is called status asthmaticus.

Asthma attacks occur when the bronchi and bronchioles becomes inflamed reducing the space through which air can travel through the lungs.

This causes the asthmatics to work harder to move air in and out of the lungs.

The inflammation occurs when an irritant such as smokes, pollens, comes into contact with the airway wall. Upon detecting the irritant as a harmful invader, the body's immune system send special cells known as mast cells to the site of irritation. The mast cells release histamine – a chemical that causes swelling and redness in a process called inflammatory response. Histamine also causes bronchospasms in which the muscles lining the airway walls contract repeatedly, causing the airway to narrow even the more. In addition, cells that lubricate the airways with mucus i.e. goblet cells overreact to the inflammatory response by secreting too much mucus.

This mucus clogs the bronchioles resulting in wheezing and coughing.

### **Cause**

Asthma attacks are caused by airway hyper-responsiveness i.e. over reaction of the bronchi and bronchioles to various environmental and physiological stimuli known as triggers. The most common cause of asthma attacks are extremely small and light weight articles transported through air and inhaled into the lungs. When they enter the airways these particles cause an inflammatory response resulting in an asthma attack.

For some people environmental triggers are allergens. Allergens are usually natural substance such as plant pollen and mould spores, animal dander (tiny pieces of animal hair and skin) and faecal materials from dust mites and cockroaches.



Asthma also occurs in people who do not have allergies. In these people, chemical irritants such as perfume, hair spray, cosmetics and household cleaners triggers the attack. Other chemical irritants include chemical and plastics as well as many forms of air pollution such as exposure to high levels of ozone, car exhaust, wood smoke and sulphur dioxide.

Aggravations of attacks can also come from within the body which is known as physiological triggers. They may include exercise and infections such as common cold. Sometimes substances that asthmatics eat or drink bring on attacks.

Chemicals found in medicine or food .g food sulphites found in beer and wine and medications such as aspirin and ibuprofen are especially problematic in asthma sufferers.

Intense emotion such as crying, shouting laughing may provoke hyperventilation, a rapid inhalation of oxygen that causes the airway to narrow. Hyperventilation often results in an attack.

Many asthmatics are sensitive to physical exercise in cold weather.

Research suggests that genetic factors may increase the risk of developing the disorder. Children with a family history of asthma are more likely to develop asthma than other children.

#### Signs and Symptoms

- An attack usually begins with a mild chest pressure and a dry cough.
- As attack intensifies, wheezing develops and increases in pitch.
- Breathing becomes difficult/shortness of breath
- Coughing produces thick stringy mucus
- Anxiety
- Feelings of suffocation.

### 3.3 The detailed history and examination for the conditions of the respiratory system include:-

The history will depend on the presenting problem. The questions to ask include

What is the symptom and when did it start?

Has there been any fever? Catarrh? Sore throat?

Is there cough? Do you bring out sputum? If so, what is the colour – yellow, green, white or with blood? Is there pain with the cough? If so, point to the place where it causes pain

If the patient five years and below, ask the following questions – is there wheezing? Any previous episodes? Is there whooping or stridor?

Do you have difficulty in breathing? Do you wake up at night short of breath?

Dyspnoea – note onset, severity, duration, efforts to treat, if accompanied by cough or diaphoresis, time of day when it most likely occurs, whether precipitated by any specific activities or accompanied by cyanosis

Are you feeding or drinking well?

Are you losing weight or do you sweat at night?

Is there diarrhoea?

Does anyone else in your have similar symptom?

Have you been treated in the past for the same problem?

Have you taken any medication? If so, what type?

If Nose problems take the history as follows

Is there nasal discharges – blood or mucus or watery or pus?

If there is nose bleeding, for how long and how much blood has been lost? Has it happened before? Was there a fall or any other injury/blow to the nose?

Any pain?

Any swelling?

Find out about the life style, does he/she smoke and if so note the type of tobacco, duration, number per day, number of years of smoking.

Occupation – work condition that could irritate respiratory system (asbestos, chemical or dry-cleaning fumes)

Geographical location – any environmental condition that could irritate the respiratory system e.g. chemical, plants, industrial pollutants

Nutrition/diet – fluid intake per 24 hours period

Past medical history – immunizations, allergies e.g. foods, drugs, chemical irritants precipitating factors.

Previous illness and treatment

The examination will include

General appearance – check whether alert, or abnormally sleepy or difficult to wake, ill looking, tired. Check if there is severe malnutrition or respiratory distress.

Inspect for configuration of the chest (kyphosis scoliosis, barrel chest which occur

With chronic respiratory disease) and cyanosis.

Note pattern of respirations

- Rate – note rate of respiration

Normal respiration rate for different age group is as follows

Infants 40-60 per minute

1 year 20-40 per minute

2-4 years 20-30 per minute

5-10 years 20-25 per minute

10-15 years 17-22 per minute

15 years and older 15-20 per minute

- Regularity – periodic respirations (periods of rapid respirations, separated by periods of slow breathing or short periods of no respiration) this is normal in young infants.

Apnoea episodes (cessation of breathing for 20 seconds or more accompanied by colour change or bradycardia); Note tachypnoea, hyperventilation or laboured breathing pattern.

- Respiratory effort

Nasal flaring- attempt to widen airway and decrease resistance

Open mouth breathing- chin drops with each inhalation

Grunting on expiration – which means that the patient has to do much extra work in order to breath

Retractions from use of accessory muscles

- Auscultate for abnormal breath sounds. Auscultation may be more difficult in infants and young children because of shallowness of respirations. Note the following

Stridor – harsh respiratory sound associated with nasal obstruction

Crackles or crepitation are crackling noises made by alveoli or bronchi which are closed but snap open and vibrate and by air bubbling through the bronchi.

Wheezing which used to be called rhonchi are whistling sounds made by air going through narrowed bronchi. They are often louder during expiration. Common in asthma, acute bronchitis and chronic obstructive lung disease

Pleural rub is a creaking, grating or rubbing noise usually heard in breathing in and out over one area. It is not changed by coughing but may be changed by pressing hard on the chest, thereby changing the position of the pleura. It is caused by pleural inflammation.

- Palpate the skin, subcutaneous structures and muscles for texture, and degree of development.

- Percuss lung fields

Note behaviour – position of comfort, signs of irritability or lethargy, facial expression (anxiety)

Observe presence and quality of cough – productive, paroxysmal with inspiratory “whoop”

Check the eyes for redness and discharges

Nose – examine the sinuses for tenderness. This is done by pressing firmly or tapping the bones containing the sinuses. Check if there is discharge and whether watery, mucous or if there is bleeding.

Check and record temperature, pulse and BP

### 3.4 General Approach to Management

From the history and examination performed assemble the relevant findings, make a clinical judgement and locate the appropriate action in your standing orders.

The goals of the management are to ensure that the patient have patent airway and satisfactory oxygenation, is free from symptoms of respiratory distress, affective breathing pattern is maintained.

Also the client will demonstrate increased balance for activity.

Anxiety is reduced, nutritional status maintained and remains free from infection. The patient is managed using the standing orders.

However, the management specific for each condition are as follows:

#### - Influenza

Provide rest, quiet environment and encourage increased intake of fluids. Give drugs the ease the symptoms.

#### - Sinusitis

##### Steam Inhalation

Give antibiotics, decongestants and analgesics. The condition typically clears within two weeks.

#### - Common Cold

Relief of symptoms through the use of drugs; Rest is encouraged.

Intake of plenty of fluids is encouraged.

#### - Epistaxis

##### Nasal Packing

Control bleeding – pinch nose firmly with fingers on soft part of nose, tilt head slightly forward, avoid hot liquids.

#### - Pneumonia

Give analgesics to relieve pain associated breathing.

Give antibiotics

Adequate rest, limited activity, good nutrition with adequate fluid intake

Good ventilation.

Teach techniques that prevent transmission

#### - Asthma

Give Bronchodilators to relieve bronchospasm

Corticosteroids to relieve inflammation and oedema

Antibiotics if there is secondary infection

Educate client concerning

- modification of environment to ensure room is well ventilated, to stay indoor during grass cutting or when pollen count is high, to use damp dusting to avoid rugs and natural fibres e.g. wool and feathers and the important of moderate exercise.

#### - Pulmonary Tuberculosis

Once the diagnosis has been confirmed, ensure that the client is treated with drugs used to treat tuberculosis in a centre designed for the purpose i.e. TBL DOT Centre. The regime for the management of pulmonary tuberculosis is included in your standing orders.

Educate clients on

- Immunization – BCG immunization to prevent infection

- Transmission prevention – to prevent infecting people around – cover mouth when coughing, expectorate in a tissue and place it in a paper bag, wash hands after coughing, or sneezing. Stress the importance of fresh air.
- Adequate nutrition – high protein, high carbohydrate diet with inclusion of supplemental vitamins, monitor weight.

#### 4.0 CONCLUSION

In conclusion, the respiratory system which is primarily an air conduction system include the nose, pharynx and larynx, in the upper region and trachea, bronchi and branches and the lungs and associated structures are in the lower region of the respiratory system.

Most of the health conditions presents with symptoms like colds, nasal discharge, cough, dyspnoea wheezing, chest pain and haemoptysis. Smoking, living conditions, occupation are some examples of life style that can predispose one to developing the conditions.

The goal of intervention in the conditions of respiratory system is to ensure adequate ventilation, maintenance of patent airway as well as affective breathing pattern and also maintain adequate nutritional status.

#### 5.0 SUMMARY

In summary you have learnt about the health conditions of the respiratory system. Some conditions like influenza, common cold, pneumonia, pulmonary tuberculosis, epistaxis and asthma were discussed. We also highlighted the signs and symptoms of each condition. The history and examination for these conditions was also discussed. Lastly the general approach to management was also discussed.

#### 6.0 TUTOR MARKED ASSIGNMENT

1. What is DOT?
2. What is your role in the use of this strategy?

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## UNIT 9 MALARIA

### TABLE OF CONTENTS

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3.2	Malaria parasites, mosquito's vector and the plasmodium life cycle
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### 1.0 INTRODUCTION

Malaria is a widespread disease in tropical and subtropical regions, including parts of the Americas (22 countries), Asia, and Africa. Each year, there are approximately 350–500 million cases of malaria, killing between one and three million people, the majority of whom are young children in sub-Saharan Africa. Ninety per cent of malaria-related deaths occur in sub-Saharan Africa. Malaria is commonly associated with poverty, but is also a cause of poverty and a major hindrance to economic development.

### 2.0 OBJECTIVES

By the end of this unit, you will be able to

- Define malaria
- Discuss Malaria parasites, Mosquito vectors and the Plasmodium life cycle
- Explain the Pathogenesis of Malaria
- Enumerate the signs and symptoms of malaria
- Explain the complications of falciparum malaria
- Describe the general approach to management of malaria

### 3.0 MAIN CONTENT

3.1 Malaria is defined as a mosquito-borne infectious disease caused by infection of the red blood cells by a protozoal organism called plasmodium of which there are four types. Malaria is caused by infection with one or more of four protozoal parasites that are listed as follows:

- Plasmodium falciparum is the most common in hot, wet climates
- Plasmodium vivax is the most wide spread of the parasites in the world and is more than P. Falciparum in places which have cool or dry seasons.
- Plasmodium malariae is not common
- Plasmodium ovale is very uncommon

The parasite, Plasmodium is transmitted via the bites of infected mosquitoes. In the human body, the parasites multiply in the liver, and then infect red blood cells

### 3.2 Mosquito vectors and the Plasmodium life cycle

Four species of the plasmodium parasite can infect humans; the most serious forms of the disease are caused by Plasmodium falciparum. Malaria caused by Plasmodium vivax, Plasmodium ovale and Plasmodium malariae causes milder disease in humans that is not generally fatal.

Only female anopheles mosquitoes feed on blood, thus males do not transmit the disease. The females of the Anopheles genus of mosquito prefer to feed at night. They usually start searching for a meal at dusk, and will continue throughout the night until taking a meal. Malaria parasites can also be transmitted by blood transfusions, although this is rare.

Anopheles mosquitoes carry Plasmodium sporozoites in their salivary glands. A mosquito becomes infected when it takes a blood meal from an infected human. Once ingested the parasite gametocytes taken up in the blood will further differentiate into male or female gametes and then fuse in the mosquito gut. This produces an ookinete that penetrates the gut lining and produces an oocyst in the gut wall. When the oocyst ruptures, it releases sporozoites that migrate through the mosquito's body to the salivary glands, where they are then ready to infect a new human host. The sporozoites are injected into the skin, alongside saliva, when the mosquito takes a subsequent blood meal.

### 3.3 Pathogenesis of Malaria

The life cycle of malaria parasites in the human body: a mosquito infects a person by taking a blood meal. First, sporozoites enter the bloodstream, and migrate to the liver. They infect liver cells (hepatocytes), where they multiply into merozoites, rupture the liver cells, and escape back into the bloodstream. Then, the merozoites infect red blood cells, where they develop into ring forms, then trophozoites (a feeding stage), then schizonts (a reproduction stage), then back into merozoites. Sexual forms called gametocytes are also produced which, if taken up by a mosquito, will infect the insect and continue the life cycle.

Partial or incomplete immunity to malaria (mostly due to antibodies) can develop after 4-10 years of continuous exposure to malaria. This means that older children or adults who have lived continuously for years in places where malaria is present all the time develop partial immunity

The persons most commonly affected by malaria are:  
Babies and children in areas where malaria is endemic  
Persons of all ages who come to malarial areas

Persons of all ages in areas where malaria is not present all the time and condition for transmission of malaria occur

Immunity to malaria may be overcome by malaria parasites in the following situations:

During pregnancy

During another illness

If a person goes for a while with no malaria parasite present in his blood

If a person shifts to a place where there is more malaria or a different type of malaria

If a person is given drugs such as cortisone or prednisolone which stop immunity working properly

If the patient has his spleen removed

Chronic malaria occurs in persons from the time they are infected with malaria until they develop enough immunity against malaria to overcome most of the malaria parasites. This may take 4-10 years and some people never develop enough immunity and continue to have chronic malaria all their lives

### 3.4 Signs and Symptoms of malaria

Signs and Symptoms of malaria usually appear between 10 and 15 days after the mosquito bite.

There may be some hours to a few days of vague ill-health (e.g. feeling cold; headache, backache and pains all over; nausea, vomiting and diarrhoea). Then the attack occurs, which may present with: -

Fever, chills and sweating; the temperature is usually raised but rigors may occur. Sometimes the temperature is normal. Most commonly the temperature is raised but it does not go away after an attack and may be continuous

central headache,

fatigue and muscular pain,

nausea and vomiting,

back pain

dry cough

spleen enlargement

Pulse and respiration are usually fast and BP is often low

The classic symptom of malaria is cyclical occurrence of sudden coldness followed by rigor and then fever and sweating lasting four to six hours, occurring every two days in *P. vivax* and *P. ovale* infections, while every three for *P. malariae*. *P. falciparum* can have recurrent fever every 36–48 hours or a less pronounced and almost continuous fever.

- For chronic malaria – there will be recurrent attacks of acute malaria, anaemia, enlarged spleen and liver, poor appetite and other gastro intestinal symptoms and signs, wasting of muscles and reduced resistance to other diseases especially recurrent attacks of bacterial infections and gastroenteritis.

### 3.5 Complications of falciparum malaria

- Hyperpyrexia – which often lead to convulsion especially in children
- Cerebral malaria – the malaria parasites may partly block the blood vessels going to the brain and may poison the brain with toxins and cause encephalitis. This condition is called cerebral malaria. This condition may cause all sorts of brain and mental symptoms and signs which include those of severe depression of brain functions such as severe headache, drowsiness, paralysis, and unconsciousness. They can also include those of irritation of the brain functions such as restlessness, irritability, confusion, abnormal (psychotic) behaviour, twitching and fitting etc. On examination, the patient is usually febrile, the neck is often stiff, the mental state is often abnormal and any of the above



signs may be found. The loss of consciousness from cerebral malaria may last for some days. Even after this, the patient may still make a full recovery.

- Hypoglycaemia – the blood sugar or glucose may become low in acute malaria. This happens especially if the malaria is severe or if the patient is pregnant or a child. This low blood glucose can cause loss of consciousness or fitting.
- Acute anaemia and hypoxia – acute anaemia with severe hypoxia (symptoms and signs of low oxygen level in the brain and the rest of the body) can occur in those who have a low haemoglobin level

### 3.6 General Approach to Management

Practical demonstration of procedure for the management of malaria

ascertain the client's age and locate the appropriate section

look up and locate fever under the table of content of the section

The next step is to carry out detailed history taking by asking the client the following questions

- how long have you had the fever?
- is there any convulsion now or has he ever had convulsion?
- is there runny nose, cough, or difficult breathing?
- is there vomiting or diarrhoea?
- is there earache, sore throat, headache, or neck stiffness?
- is there any muscle or joint pains, pain in the back or in the arms and legs?
- is there pain or burning on micturition?
- is there any weight loss?
- is anyone currently ill in the family?
- has any analgesic or other medication been given?

The response of the client to the above is recorded on the treatment card.

You will now perform detailed examination thus, to assess the condition and be able to make clinical judgement that will lead you to the appropriate action from the standing orders.

Carry out detailed examination as follows:

- general appearance – check whether ill, weak, alert, restless, drowsy or convulsing
- check the skin for rashes, septic spots or profuse perspiration
- head – in children check the fontanelle whether bulging or depressed
- eyes – check for jaundice or redness
- ear – check for tenderness behind the ear, discharges, redness or dullness of the ear drum
- nose – examine for catarrh/discharges; whether clear or purulent discharges
- mouth – examine the throat for redness
- neck – examine for stiffness and if there is any node
- chest – respiratory rate; note any rapid or laboured respiration, lower chest in drawing/retraction, auscultate the breath sound and note if there is wheeze, crepitation/stridor in a calm child; any decreased breath sounds.
- breasts – examine for swelling and tenderness
- abdomen – any distension; palpate for enlarged spleen or masses and tenderness
- genitalia – examine for discharges, sores, rashes and swelling
- check and record the temperature, pulse and BP

## Treatment and Prevention of Malaria

From the history and examination performed assemble the relevant findings, make a clinical judgement and locate the appropriate action in your standing orders.

All patients with fever and anaemia must be treated with antimalarials unless it can be proved that they do not have malaria.

### Malaria case management strategies

- Early detection of symptoms
- Early commencement of treatment
- Early recognition of danger signs of complication
- Artemisinin-based combination therapies
  - Arthemeter-Lumefantrin
  - Arthemeter-Amodiaquine
  - Arthemeter-Sulphadoxine-Pyrimethamine

(The dosage is according to age as stated in your standing orders)

### Malaria in pregnancy rational approaches

- Prevention – use of LLIN
- Focus ANC – Intermittent presumptive treatment (IPT) during 2<sup>nd</sup> & 3<sup>rd</sup> trimesters
- Early detection of symptoms
- Early commencement of treatment
- Early recognition of danger signs of complication

Early diagnosis of malaria and its effective and timely treatment reduces morbidity and prevents death from malaria. A wide variety of antimalarial drugs are available to treat malaria. In the last 5 years, treatment of *P. falciparum* infections in endemic countries has been transformed by the use of combinations of drugs containing an artemisinin derivative. Severe malaria is treated with intravenous or intramuscular quinine or, increasingly, the artemisinin derivative artesunate. Several drugs are also available to prevent malaria in travellers to malaria-endemic countries (prophylaxis). Resistance has developed to several antimalarial drugs, most notably chloroquine

## Prevention and Control Strategy

Malaria transmission can be reduced by preventing mosquito bites by distribution of inexpensive mosquito nets and insect repellents, or by mosquito-control measures such as spraying insecticides inside houses and draining standing water where mosquitoes lay their eggs.

Vector control remains the most generally effective measure to prevent malaria transmission and therefore is one of the four basic technical elements of the Global Malaria

The principal objective of vector control is the reduction of malaria morbidity and mortality by reducing the levels of transmission. Vector control methods vary considerably in their applicability, cost and sustainability of their results. The approach seeks to improve the efficacy, cost-effectiveness, ecological soundness and sustainability of disease-vector control.

Its characteristic features include:

selection of proven vector control methods based on knowledge of local vector biology and ecology, disease transmission and morbidity; utilization of a range of interventions, separately or in combination and often synergistically; collaboration within the health sector and with other public and private sectors that impact on vector breeding; engagement with local communities and other stakeholders; a public health regulatory and legislative framework; rational use of insecticides; good management practices

The Roll Back Malaria initiative was initiated by WHO Director-General Dr. G. Brundtland in October 1998 to fight malaria by applying new tools for controlling the disease as well as strengthening the health services of the targeted nations.

The goal of the RBM initiative is to help disease endemic nations including Nigeria develop policies and implement relevant elements of the RBM strategy. The six elements of the roll back malaria are

- Early detection of malaria illness
- Rapid treatment of those who are ill
- Multiple means for preventing infection
- Strengthening of health sectors and inter-sectoral activities
- A powerful sustained social involvement and movement
- Focused research for new tools and better implementation

The new tools available to combat malaria are

- Rapid diagnostics
- New drugs (artesanates) and new means of delivery
- Impregnated bed nets – long lasting insecticide treated bed nets (LLINs)
- Means of predicting epidemics (satellite mapping)

The Roll Back Malaria Partnership (RBM) is the global framework for coordinated action against malaria. It forges consensus among key actors in malaria control, harmonises action and mobilises resources to fight malaria in endemic countries.

#### 4.0 CONCLUSION

About 3.3 billion people - half of the world's population - are at risk of malaria. Every year, this leads to about 250 million malaria cases and nearly one million deaths. People living in the poorest countries are the most vulnerable.

Once a person develops malaria, preventing death is by diagnosing and treating the disease. Malaria diagnosis can be made even at the community level, and treated with very effective medicines by way of artemisinin-based combination therapies.

Vector control remains the most generally effective measure to prevent malaria transmission and the basic technical elements of the Global Malaria Control Strategy

#### 5.0 SUMMARY

Malaria is caused by a parasite called Plasmodium, which is transmitted via the bites of infected mosquitoes. In the human body, the parasites multiply in the liver, and then infect red blood cells.

Symptoms of malaria include fever, headache, and vomiting, and usually appear between 10 and 15 days after the mosquito bite. If not treated, malaria can quickly become life-threatening by disrupting the blood supply to vital organs. In many parts of the world, the parasites have developed resistance to a number of malaria medicines.

Key interventions to control malaria include: prompt and effective treatment with artemisinin-based combination therapies; use of insecticidal nets by people at risk; and indoor residual spraying with insecticide to control the vector mosquitoes.

#### 6.0 TUTOR MARKED ASSIGNMENT

Discuss roll-back malaria strategy

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## **MODULE III**

## UNIT 10: HEALTH CONDITIONS OF THE GENITOURINARY (MALE)

### TABLE OF CONTENTS

- 1.0 Introduction
- 2.0 Objectives
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  - 3.1 Overview of the physiology pathophysiology and health conditions of male genitourinary system
  - 3.2 History and examination for the male genitourinary system
  - 3.3 Management approach to identified health conditions of male genitourinary system
- 4.0 Conclusion
- 5.0 Summary
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- 7.0 References and further readings

#### 1.0. INTRODUCTION

In this unit, we will be discussing the health conditions of the genitourinary system, since the male and female genitalia differ, it will be discussed separately. This unit will discuss the male urinary and reproductive system.

#### 2.0. OBJECTIVES

By the end of this unit, the learner should be able to

- Discuss the physiology, pathophysiology and the health condition of the genitourinary system affecting males.
- Explain the detailed history and examination performed on the male genitourinary system
- Explain the general approach to management of identified health conditions.

#### 3.0 MAIN CONTENT

- 3.1 Physiology, pathophysiology and the health condition of the genitourinary system affecting males. The genito urinary system includes the kidney, ureters, urinary bladder, urethra, penis, scrotum, testes, ductal system and accessory glands which include the prostate, cowper's glands and seminal vesicles.

The urinary system includes:-

Kidneys – Two bean shaped organs that lie in the retroperitoneal space on either side of the vertebral column. Adrenal glands are located on top of each kidney. The components are cortex, medulla, renal pelvis, nephron.

The cortex is the outer layer of the kidney containing glomeruli, proximal tubules of nephron and distal tubules of nephron.

Medulla is the inner layer of the kidney, containing loops Henle and collecting tubules.

Renal Pelvis – Collects urine from calices.

Nephron – Functional unit of Kidney composed of Bowman's capsule, glomerulus and renal tubule.

Renal Tubule – Consist of proximal convoluted, loop of Henle, distal convoluted and collecting segments.

Ureters- This tubule extends from renal pelvis to bladder floor. It transports urine from the kidney to the bladder ureterovesical sphincter prevents reflux of urine from bladder into ureter.

Bladder – This is a muscular, distendable sack that stores urine. The total capacity is approximately 1 litre.

Urethra – This tubule extends from the bladder to the urinary meatus. It transports urine from the bladder to the urinary meatus. In males it extends the entire length of the penis.

#### Regulatory function of the Kidney

Kidney and urinary system play a major role in the maintenance of homeostatic control of the body. Kidney removes nitrogenous wastes and regulates fluids, electrolyte and acid-base balance. Urine is the end product of these mechanisms.

Blood Pressure Control – Kidneys regulate blood pressure partly through maintenance of fluid volume (formation / excretion of urine).

The rennin – angiotensin system is the other kidney controlled mechanism that can contribute to the rise in the blood pressure. When blood pressure drops, the cells of the glomerulus release rennin which then activates angiotensin to cause vasoconstriction.

#### The Male Reproductive System

Penis - An external structure that serve as a passage for urine and semen. It is capable of distension during sexual excitement.

Distal portion, glans penis is covered by a prepuce or fore skin that may or may not be removed. When it is removed it is referred to as circumcision.

Scrotum – saclike structure that hangs from the root of the penis. Contains testes and epididymis and helps to regulate temperature conducive to sperm production.

Testes – small oval structures suspended in the scrotum. It produces sperm (exocrine function) and male hormones (endocrine function).

#### Ductal System

Epididymis – First part of ductal system. It is soft cordlike structure that lies along the posterior lateral surface of each testis. Head is attached to the top of the testis; tail is continuous with vas deferens. It stores spermatozoa while they mature.

Spermatic Cord – Consist of vas deferens, arteries, veins, nerves and lymphatic vessels.

#### Accessory Glands

Prostate - It is located below the bladder and in front of the rectum approximately 4 – 6 cm long. It is enclosed in firm fibrous capsule, connected to the urethra and ejaculatory ducts. It secretes milky fluid that aids in the passage of spermatozoa and helps keep them viable.

Seminal vesicles – A paired structures parallel to the bladder. Secrete a portion of the ejaculate and may contribute to nutrition and activation of sperm.

### **DISORDERS OF THE MALE GENITOURINARY SYSTEM**

#### **Disorders of the urinary system**

**Cystitis** – This is the inflammation of the bladder due to bacterial invasion. Predisposing factors include stagnation of urine, obstruction, sexual intercourse.

Signs and Symptoms

Abdominal or flank pain / tenderness,

Frequency and urgency of urination

Pain on voiding

Nocturia

Fever

**Pyelonephritis** – Inflammation of the renal pelvis. It may be unilateral, or bilateral acute or chronic.

Acute infection usually ascends from lower urinary tract.

Chronic infection is thought to be a combination of structural alteration along with infection. Major cause is ureterovesical reflux with infected urine backing up into ureters and renal pelvises. Result of recurrent infections is eventual renal parenchyma deterioration and possible renal failure.

Signs and Symptoms

For Acute – there is fever, chills, nausea and vomiting, severe flank pain and tenderness in kidney or dull ache, dysuria, burning frequency, pyuria and haematuria.

For Chronic - patients are usually unaware of the disease but may have bladder irritability, chronic fatigue or slight dull ache over kidney. Eventually may develop hypertension, atrophy of kidney.

**Urinary Tract Infection (UTI)**

This is a bacterial invasion of the kidney or bladder; it is usually caused by *E. coli*. Predisposing factors include poor hygiene, irritation, and urinary reflux. The invading organism ascends the urinary tract irritating the mucosa and causing characteristic symptoms.

Signs and Symptoms

Low grade fever

Abdominal pain

Enuresis, pain/burning on urination, frequency, haematuria

**Urethritis** – inflammation of the urethra. May develop scar tissue and stricture causing obstruction, cystitis and nephritis. It may result from injury sustained during instrumentation or catheterization or as a result of gonococcus infection.

Signs and Symptoms

Urgency

Frequency

Dysuria

Burning on urination

Purulent discharge

**Acute Renal Failure**

This is a sudden damage to the kidneys causing cessation of function and retention of toxins, fluids and end products of metabolism.

Causes include blood transfusion reaction, shock, toxins, burns or trauma.

Sign and Symptoms

Lethargy, headache and drowsiness, convulsion, nausea, vomiting and diarrhoea

Sudden oliguria or anuria

Increase bleeding time.

**Chronic Renal Failure**

This is progressive kidney damage. There is deterioration of the nephron, the kidney stops functioning. This is the final stage of many chronic diseases for example hypertension.

Causes include glomerulonephritis, pyelonephritis, urinary tract obstruction, essential hypertension, and Lupus erythematosus.



## Signs and Symptoms

Malaise

Nausea and Vomiting

Anaemia

Hyperkalemia

Twitching

Hypertension

Very susceptible to infection and ulcers in the mouth

There is bleeding tendency and delayed wound healing

Uremic Frost – Urea is excreted in perspiration onto the skin and small crystals can be seen. This causes severe pruritus.

Headaches and visual disturbances, disorientation, convulsion, coma and death

## **Congenital/Paediatric disorders of the Genitourinary System**

- Extrophy of the bladder

This is a congenital malformation in which there is non-fusion of abdominal and anterior wall of the bladder during embryonic development. It causes the anterior surface of the bladder to lie open on abdominal wall.

- Undescended Testicles - Unable to palpate testes in scrotal sac

This is the unilateral or bilateral absence of testes in scrotal sac. Testes normally descend at 8 months of gestation. Incidence is increased in children having genetically transmitted diseases.

75% will descend spontaneously by age 1 year.

- Hypospadias

This is a congenital condition in which the urethral opening is located anywhere along the ventral surface of the penis. This is often associated with ventral curvature of the penis thus causing constriction.

The urinary meatus is misplaced and there is inability to make straight stream of urine.

- Enuresis

This refers to involuntary passage of urine after the age of control is expected. This control is expected at about 5 year of age. The physical examination is normal but there may be history of repeated involuntary urination

There are 2 types.

Primary - the child is this type that has never achieved control.

Secondary – Children who have this type have once developed complete control but lost it. It may occur anytime of the day but it's most frequent at nights and it is more common in boys.

No organic cause can be identified but there may be familial tendency.

Etiologic possibilities include

Sleep disturbances

Delayed neurologic development

Immature development of bladder leading to decreased capacity.

Psychological problems

## **Disorders of the Male Reproductive System**

**Epididymitis** refers to inflammation of epididymis. It is one of the most common intrascrotal infections. Maybe sexually transmitted, usually caused by N. gonorrhoea, C trachomatis. It can also be caused by genitourinary instrumentation, or urinary reflux.

Sign and Symptoms

Sudden scrotal pain, scrotal oedema, tenderness over spermatic cord

Urine culture reveals specific organism.

**Prostatitis** – This is inflammatory condition that affects the prostate gland. It could be acute or chronic bacterial prostatitis or abacterial chronic prostatitis. Most important predisposing factor is lower UTIs.

Sign and Symptoms

Acute – Fever, chills, dysuria, urethral discharge, prostatic tenderness, copious purulent urethral discharge upon palpation.

Chronic – Backache, perineal pain, mild dysuria and frequency, enlarged, firm and slightly tender prostate upon palpation.

**Hydrocele** - This is a cystic mass filled with fluid that forms around the testicle, which could be due to infection or trauma.

Sign and Symptoms

There could be discomfort in sitting and walking.

### **Sexually Transmitted Diseases**

**Syphilis** is a condition transmitted via sexual contact or warm blood. It is caused by a spirochete *Treponema Pallidum*.

It appears in 3 stages.

Primary Stage – after incubation periods of 10 to 60 days (usually 3 weeks) during which there are no symptoms, an ulcer or chancre appears at the site of entry. It contains many organisms and it is highly infectious.

There may be minor local discomfort or mild generalized symptoms e.g. headache, or lymph node enlargement without treatment, it heals in 3 to 5 weeks.

Secondary stage – 3 weeks later it appears as a mild rash on skin (usually palms of hand and soles of feet) and as papules on mucous membrane. All lesions contain organisms and are highly contagious. Symptoms may be mild or generalized e.g. bone pain, sore throat, hair loss in patches or lymph node changes) lasts for a few weeks and becomes dormant if not treated. Patient is infectious for about 1 year.

The Third or Latent Stage – 10 to 30 years later, the spirochetes, deposited in tissues and organs form lesions and destroys the tissue; common sites are the CNS, eyes and the aorta.

**Gonorrhoea** is a highly communicable disease. There is inflammation of the urethra and spread to other organs of the genital tract. Incubation period is 3 to 4 days.

It is caused by *Neisseria gonorrhoea* transmitted by sexual contact.

Sign and Symptoms

Male patients have purulent urethral discharge and burning on urination, may develop urethral stricture, epididymitis or prostatitis.

**Herpes Genitalis** is fluid filled vesicles on genitalia. It forms crusts causing generalized symptoms such as elevated temperature, pain. May have no symptoms and there may be repeated episodes. It is caused by herpes virus.

- 3.2. Ascertain the client's age and locate the appropriate section in your Standing Orders  
Look up urinary and genital problems or sexually transmitted infection (male) under the table of content of the section  
Detailed history taking is carried out thus:  
Detailed history taking is done by asking the client the following questions  
History on the presenting problem for which symptoms may include

- Pain in flank groin dysuria
- Changes in urination patterns – the frequency, any nocturia, hesitancy of stream, urgency, dribbling, incontinence, retention, burning or pain on micturition
- Changes in urinary output: - polyuria, oliguria, anuria.
- Changes in colour consistency of urine – is it diluted concentrated, malodorous, haematuria, pyuria.

Ask if there is a urethral discharge; is it purulent, mucoid, abundant, or scanty?

Ask if he has had it before and if so how long ago?

Was the urethral discharge after a particular sexual intercourse? Have you had sexual contact after you noticed the discharge? If so, with whom?

How long has he had the problem?

History about life style – Occupation (type of employment, exposure to chemicals such as carbon tetrachloride, ethylene, glycol) level of activity and exercise

Nutrition/diet – water, dairy products and calcium intake.

Past medical history – has he had any of the following

Hypertension, diabetes mellitus, gout, cystitis, kidney infections, connective tissue diseases, (systematic lupus erythematosus) infectious diseases, drug use (prescribed/over the counter), previous catheterizations, hospitalizations or surgery for renal problems.

Family History - any family member with hypertension, diabetes mellitus, renal disease, gout, connective tissue disorders, urinary tract infections, renal calculi.

Ask about the treatment that has been taken

Detailed Examination will include

General appearance – check if ill, puffy or thin

Inspect skin for colour, turgor and mobility, purpuric lesions, integrity.

Check for oedema – of the face particularly peri-orbital oedema; of the back; of the extremities

Inspect mouth for colour, moisture, odour, ulcerations.

Abdominal examination

Inspect abdomen and palpate bladder for tympany or dullness

Observe bladder (if full) for distension – abdomen will be rigid, tense, swollen and sensitive to touch

Palpate right and left kidneys for tenderness, pain, enlargement

Percuss costovertebral angles for tenderness/pain.

Fist percuss kidneys for tenderness/pain.

Look at the pubic hair for lice; Check genitals (Scrotum, anal area) for irritation and rashes

Examine the groin area for – ulcers or lymph nodes enlargement

Look at the penis for sores or ulcers; feel if a sore is hard or soft and if it is tender

Squeeze the urethra gently to see if any discharge comes out of it

Look at the scrotum for sores or ulcers; gently feel the epididymides and testes for swelling, lumps or tenderness.

Put the patient onto his side and ask him to lift his knees so that you can look at the perianal area region for sores or discharges

Carry out pelvic examination through the rectum to palpate the prostate for size, shape consistency, enlargement and tenderness

Check vital signs –

Temperature

Determine rate, rhythm and depth of respirations

Pulse

Blood Pressure

Urine for Urinalysis – Colour, PH and specific gravity determine presence of glucose, protein, blood, ketones

Analyze sediments for cells; culture and sensitivity

Residual Urine – Amount of urine left in bladder after voiding measured via catheter.

Creatinine Clearance – determines amount of creatinine (waste product of protein breakdown) in urine over 24 hours, measures overall renal function.

Blood Studies include

Serum Creatinine – Specific test for renal disorders reflects ability of kidneys to excrete creatinine.

Electrolytes – Bicarbonate, calcium, phosphorus, sodium, potassium.

BUN – measures renal ability to excrete urea nitrogen

PSA - Prostate Specific Antigen

### 3.3. General Approach to Management

From the history and examination performed assemble the relevant findings, make a clinical judgement and locate the appropriate action in your standing orders

Generally for urinary tract infections,

- Antibiotics e.g. ampicillin, cephalosporin
- Urinary antiseptics e.g. Nitrofurantoin, nalidixic acid
- Sulphonamides e.g. trimethoprim – Sulfamethoxazole (Bactrim)
- Urinary tract analgesics (pyridium)

Force Fluids – 3000 ml daily over that of dietary intake unless contraindicated.

Proper care of the perineal area

Diet that acidifies urine should be encouraged

Sitz baths for comfort.

Follow up care for up to 1 year.

The management for enuresis

Teach bladder retention exercises, counsel on behaviour modification e.g. use of bed alarm devices.

Counsel family to give praise and support to small accomplishments and to avoid scolding and belittling the child

Conditions of male genitourinary system that are not covered by the standing orders or will require operation are referred to specialist.

Sexually transmitted diseases are managed with the syndromic management for STIs in the standing orders.

### 4.0. CONCLUSION

The Male genitourinary system consists of the kidneys, ureters, bladder, the urethra and the genital. The main function of the urinary system is to regulate the composition and volume of blood excretes metabolic wastes and fluids and maintains fluids and electrolyte balance as well as acid balance of the body. If there is malfunctioning due to infection, congenital malformation or abnormal growth/development of any of the organs, health conditions results. These conditions can either be treated using systemic medications or referred to a specialist for proper management.

## 5.0 SUMMARY

This unit discussed the genitourinary system of males. It began with the introductory review of the anatomy and physiology, followed by the disorders of the male genitourinary system. The History and examination for the system was also discussed as well as the general approach to management. In the next unit the female genitourinary system will be discussed.

## 6.0 TUTOR MARKED ASSIGNMENT

Enumerate and define the terms used to describe urinary output.

## 7.0 REFERENCE AND FURTHER READING

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## UNIT 11: HEALTH CONDITIONS OF THE GENITOURINARY (FEMALE)

### TABLE OF CONTENTS

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
  - 3.1 Introductory review of anatomy and physiology of the female genitourinary system
  - 3.2 Pertinent health conditions of the female genitourinary system
  - 3.3 History and examination for the female genitourinary system
  - 3.4 Management approach to identified health conditions of female genitourinary system
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor Marked Assignment
- 7.0 References and further readings

### 1.0 INTRODUCTION

In the last unit, we discussed the male genitourinary system. This unit will discuss the female genitourinary system. They are discussed separately because of the peculiarity of each, both in the anatomy and physiology, and the presentation of health conditions.

### 2.0 OBJECTIVES

By the end of this unit, you should be able to

- Discuss the introductory review of anatomy and physiology of the female genitourinary system.
- Discuss the pertinent health conditions of the female genitourinary system
- Explain the history to be obtained and the physical examination for the genitourinary system.
- Discuss the management for the conditions of the female genitourinary system.

### 3.0 MAIN CONTENT

#### 3.1 The introductory review of anatomy and physiology of the female genitourinary system.

The female urinary system is similar to that of males with only a few variations. It is also made up of 2 kidneys, 2 ureters, 1 bladder and the urethra. The main difference is in the urethra which in females, is located behind the symphysis pubis and anterior to the vagina approximately 3 – 5 cm long.

The female reproductive system is divided into 2 namely the external structures and the internal structures.

## External structures

### Vulva made up of

- Labia majora – two long folds of skin on each side of vaginal orifice outside of the labia minora
- Labia minora – two flat, delicate folds of skin that are highly sensitive to manipulation and trauma, enclose the region called vestibule which contains the clitoris, the urethral orifice and the vaginal orifice.
- Clitoris – very sensitive erectile tissue becomes swollen with blood during sexual excitement.
- Vaginal orifice – opening into vagina, hymen fold of mucosa partially closes orifice and generally is ruptured during first sexual intercourse.
- Bartholin's glands – located on each side of vaginal orifice, secretes lubrication fluid.

Perineum – this is between vaginal orifice and anus. Forms the pelvic floor

### Internal Organs

- Ovaries – the main sex glands. It is located on either side in the pelvic cavity. It produces ova which form in the graafian follicles

The rupture of a follicle releases an ovum otherwise referred to as ovulation. This ruptured follicle becomes a glandular mass called corpus luteum. Corpus luteum secretes oestrogen but mainly progesterone.

- Fallopian tubes – it extends from a point near ovaries to uterus. There is direct connection between ovaries and tubes.
- Fimbriae – finger-like extensions on tubes. Pick up ova and transport into fallopian tubes. Fertilization occurs about midway in the fallopian tubes.
- Uterus – it is a pear-shaped hollow, muscular organ located between bladder and rectum. It increases tremendously in size to accommodate a foetus. It is divided into 3 parts namely:

Body – upper main part

Fundus – bulging upper surface of the body

Cervix – neck of the uterus

- Endometrium – this is the lining of the uterine wall. Sloughs off during menstruation

Functions of the uterus are menstruation, pregnancy and labour.

- Vagina – this is a wrinkled mucous membrane (rugae), located between the rectum and urethra. It is capable of great distension.

It functions as the lower part of the birth canal, receives semen from male and serves as passage for menstruation flow.

Breast – (mammary glands) – it is located over the pectoral muscles. The size depends on adipose tissue rather than glandular size and consists of lobes, lobules and milk secreting cells (acini)

Ducts from milk secreting cells lead to the opening called the nipple.

Areola is the pigmented area surrounding the nipple.

The function of the female reproductive system is for reproduction and production of hormones progesterone and oestrogen.

The Pelvis – right and left innominate bones sacrum and coccyx form the bony passage through which the baby passes during birth. Relationship between pelvis size/shape and baby may affect labour or make vaginal delivery impossible.

Pelvic shapes are:

Android – narrow, heart shaped, male type pelvis

Anthropoid – narrow, oval shaped resembles ape pelvis

Gyneacoid – classic female pelvis, wide and well-rounded in all directions.

Platypelloid – wide, but flat may still allow vaginal delivery.

Pelvic divisions are:

False pelvis – shallow upper basin of the pelvis which support the enlarging uterus, but not important obstetrically

Linea terminalis – plane dividing upper or false pelvis from lower or true pelvis.

True pelvis – consist of pelvic inlet, pelvic cavity and pelvic outlet. Measurement

of true pelvic influence the conduct and progress of labour Menstrual Cycle

Menstruation is the periodic shedding of the endometrium when there has been no conception. The menstrual cycles are a complex pituitary/ovarian /uterine interaction. The follicle stimulating hormone (FSH) from the anterior lobe of the pituitary stimulates the formation of the follicle. One ovum from the ovary ripens in the graafian follicle, each month and is discharged into the fallopian tube.

Oestrogen being produced by the follicle, builds up the endometrium in expectation of a fertilized ovum. The ovum is discharged into the fallopian tube by the luteinizing hormone (LH) from the anterior lobe of the pituitary gland. It also converts the follicle into the corpus luteum.

Corpus intemum secrets progesterone and oestrogen for final preparation of the endometrium.

When fertilization/implantation does not occur the endometrium is shed (menstruation).

Menarche – onset of the menstrual cycle, also known as puberty

Menopause – (climacteric) the gradual cessation of menstrual cycle and the end of the ability to bear children. It occurs at approximately 45years of age. At this time ovaries lose their ability to respond to hormones. There is decrease in the levels of progesterone and oestrogen resulting in failure to ovulate, less irregular monthly flow, and cease gradually. The reproductive organs atrophy.



### 3.2 Disorders of the female genitourinary system.

The health condition of the female urinary system is similar to that of male urinary system in the signs and symptoms, and the management.

The health conditions to be focused on in this unit are mainly those that affect the female reproductive system and are discussed as follows:-

#### **i) Menstrual abnormality**

**Dysmenorrhea** – This is defined as intense pain at the time of menses, it is usually associated with ovulatory cycles.

There are uterine spasms that cause cramping of the lower abdomen.

It is intensified by stress, cultural factors and presence of an intra-uterine devices or infection.

High levels of prostaglandins are found in menstrual flow of women with dysmenorrhea.

**Amenorrhea**

Absence of menstruation, possibly caused by underlying abnormality of endocrine system, rapid weight loss or strenuous exercise

**Menorrhagia**

This is excessive menstrual flow, possible caused by endocrine imbalance tumours, infection.

**Metrorrhagia**

This is inter-cyclic bleeding; frequently occur as a result of disease process

#### **ii) Disorders of internal reproductive organs**

**Endometriosis**

This is a condition where endometrial tissue is found outside the uterus attached to the ovaries, colon, round ligaments etc. This tissue reacts to the endocrine stimulation cycle as does the intra uterine endometrium resulting in inflammation of the extra uterine sites.

Condition may result in adhesions, fusion of pelvic organ bladder dysfunction, and stricture of bowel or sterility.

Signs and Symptoms usually appear in women over 30 years of age. There is discomfort of pelvic area before menses, becoming worse during menstrual flow and diminishing as flow ceases. There may be dyspareunia and infertility.

**Uterine Fibroid Tumour:** - This is a benign tumour located in the uterus. It develops slowly and symptoms occur only in relation to size, location and number of tumours present. It occurs in 25% of women over 35 years of age.

Signs and Symptoms

Menstrual disturbances

Backache

Frequent urination

Constipation

Uterine enlargement

**Vagina Fistula**

A fistula is a tube like opening two internal organs.

Three types of fistula affect the female reproductive organs. They are:

**Ureterovaginal fistula** – opening between the ureter and vagina- Urine leaks into vagina.

**Vesicovaginal fistula** – opening between bladder and vagina - Urine leaks into vagina.

**Rectovaginal fistula** – opening between rectum and vagina - Flatus and faecal matter leak into vagina

Causes include radiation therapy, gynaecologic surgery or traumatic child birth.

Signs and Symptoms

Leakage of urine, flatus and faecal matter into the vagina

Pain in the affected area

Excoriation of the vagina

Malodour

Cystocele and Rectocele

Cystocele is the abnormal protrusion of the bladder against the vaginal wall.

Rectocele is the abnormal protrusion of part of the rectum against the vaginal wall.

It results when the supporting muscles and ligaments of the pelvis are weakened. This can be caused by childbirth injuries, repeated pregnancies with short interval between, menopausal atrophy and congenital weakness.

Signs and Symptoms

Pelvic pressure

In cystocele there will be stress incontinence, dysuria and there will be residue of urine after voiding.

In rectocele there will be

Constipation or incontinence of faeces & flatus and haemorrhoids

Ovarian Tumours

This is mass of tissue growing on the ovary. It is usually asymptomatic until large enough to cause pressure.

There are 2 classifications

Ovarian cyst – a benign condition but may transform to a malignancy.

It varies in size. It may be small containing clear fluid or may be filled with a thick yellow fluid.

Malignant Tumour – usually a cancerous cell travels from another organ, and a secondary malignant site is established.

Signs and Symptoms

Pelvic pain

Menstrual disturbance

Abdominal distension

Constipation

Dyspareunia and Palpable mass

Cancer of Cervix

This is new growth of abnormal cells in the neck of the uterus. The early stage is confined to the epithelia cervical layer. It will continue to invade surrounding area such as bladder and rectum.

Signs and Symptoms

It is asymptomatic in early stages. May present with menstrual disturbances, postmenopausal bleeding after intercourse, watery discharge.

### **iii) Disorder of Breast**

Fibrocystic Breast disease – This is a fibre like tumours of the breast tissue with cyst formation

The cause is unknown but possibly, may be due to hormonal imbalances.

Condition occurs during reproductive years and disappears with menopause.

Cancer of the breast

A small painless, fixed lump most frequently located in upper, outer portion of the breast.

High risk factors include:

Women aged 30 – 50 years who have nursed,

Women with

fibrocystic breast disease

- a positive family history
- history of early menarche

Women whose first pregnancy was after age 25 years

Women who have never had children

Signs and Symptoms

Palpation of lump in the upper outer quadrant which is the most frequent site

Skin of breast dimpled

Nipple discharge

Asymmetry axillary nodes

Nipple retraction elevation

#### **iv) Infections**

Vaginitis – inflammation of the vaginal mucosa caused by invasion of virulent organisms permitted by changes in normal flora and also when the PH becomes alkaline.

There are four classifications

Trichomoniasis – caused by a protozoan.

Major symptom is profuse foamy white to greenish discharge that is irritating to genitalia.

Candida Albicans – it is caused by yeast transmitted from GI tract to the vagina. Overgrowth may occur in pregnancy, with diabetes and with steroid or antibiotic therapy.

Vaginal examination reveals thick, white, cheesy patches on vaginal walls.

Atrophic – (senile) it occurs in post-menopausal women because of atrophy of vaginal mucosa. There is blood-flecked discharge with burning and itching of the vagina and dyspareunia.

Simple – invasion by Staphylococci, Streptococci or Escherichia Coli. It is characterized with profuse yellow mucoid discharge with irritation to vulva and urethra.

Pelvic inflammatory Disease (PID)

This is an inflammation of the pelvic cavity. It may be confined to one or more structures of internal reproductive organs. It may be fallopian tubes, ovaries, pelvic peritoneum, pelvic veins or pelvic tissue. It may result in adhesion, strictures or sterility.

Most common causative organism is gonococcus but may also be caused by staphylococcus or streptococcus.

Signs and Symptoms

Pain in the lower abdominal and pelvic regions

There also low-back pains

Nausea

Malodorous purulent discharge

Fever

Vomiting

Sexually Transmitted Diseases (STD)

Infections occurring predominantly in the genital area and spread by sexual relations

## Herpes

Genital herpes is caused by herpes simplex virus type 2. It causes painful vesicles on genitalia both external and internal.

## Chlamydia

Currently most common STD in developed countries symptoms similar to gonorrhoea (cervical/vaginal discharge) or may be asymptomatic.

Can be transmitted to foetus at birth causing neonatal ophthalmia

## Gonorrhoea

Caused by *N. gonorrhoea*

Symptoms may include heavy, purulent vaginal discharge but often asymptomatic in female.

May be passed to foetus at birth causing ophthalmia neonatorum and sepsis

## Syphilis

It is caused by *Treponema pallidum* (spirochete). It cross placenta after 16 weeks of pregnancy to infect foetus. Initial symptoms are chancre and lymphadenopathy. It may disappear without treatment in 4 – 6 weeks. Secondary symptoms are rash, malaise and alopecia. These two disappear in several weeks without treatment.

Tertiary syphilis may recur later in life and affect any organ system especially cardiovascular and neurologic systems.

### 3.3 Detailed history

Ascertain the client's age and locate the appropriate section in your Standing Orders

Look up urinary and genital problems or sexually transmitted infection (female) under the table of content of the section

Detailed history taking is carried out thus:

Detailed history taking is done by asking the client the following questions

History on the presenting problem for which symptoms may include

- Pain – lower abdominal pain and cramping
- Backache
- Urine or faecal material draining from vaginal tract
- Changes in urination patterns – the frequency, any nocturia, hesitancy of stream, urgency, dribbling, incontinence, retention, burning or pain on micturition
- Changes in urinary output: - polyuria, oliguria, anuria.
- Changes in colour consistency of urine – is it diluted concentrated, malodorous, haematuria, pyuria.

External genitalia – Any burning or itching

Any vaginal discharge? If so, how long have you had the discharge?

What is the colour and consistency? Is it smelly and itchy? Any dyspareunia Was the vaginal discharge after a particular sexual intercourse? Have you had sexual contact after you noticed the discharge? If so, with whom and was there any dyspareunia?

Menstrual Cycle - Duration of cycle, number of days between cycles; date of the last menses; any associated symptoms like pain, headache, irritability, depression, insomnia, fatigue, mood swings.

Any symptoms related to hormone changes e.g. vasomotor instability (hot flashes and night sweats).

Breast – any tenderness/pain, swelling; the nipples - any burning or tenderness

Sexual history/social history – how many sexual partner does she have?

Lifestyle – occupation, level of activity, exercise, nutrition/diet water calcium, dairy product intake.

Obstetric history – age attained puberty, menarche, pregnancy history, history of labour and delivery; any miscarriage/abortion; are you using IUCD

Past medical history – hypertension, diabetes mellitus, gout, cystitis, kidney infections, infectious diseases, drug use, previous catheterization, hospitalization or surgery.

Family history – of hypertension diabetes mellitus, renal diseases gout, urinary tract infections (UTIs)

Ask about the treatment that has been taken

Detailed Examination will include

General appearance – check if ill, puffy, thin or in pain

Inspect skin for colour, turgor and mobility, purpuric lesions, integrity.

Check for oedema – of the face particularly peri-orbital oedema; of the back;  
of the extremities

Inspect mouth for colour, moisture, odour, ulcerations.

Examine breasts – contour, skin dimpling, nodules (size, consistency, mobile or fixed) and nipples (asymmetry retraction, rash ulceration, discharge)

Abdominal examination

Inspect abdomen and palpate bladder for tympany or dullness

Observe bladder (if full) for distension – abdomen will be rigid, tense, swollen and sensitive to touch

palpate for suprapubic tenderness, guarding of the abdomen

Palpate right and left kidneys for tenderness, pain, enlargement

Percuss costovertebral angles for tenderness/pain.

Fist percuss kidneys for tenderness/pain.

Look at the pubic hair for lice

Examine the groin area for – ulcers or lymph nodes enlargement

Examine the perineum and genitalia. Cover the abdomen down to the knees with a sheet.

Ask the patient to lie on her back and bend her knees until the heels touch the buttocks. You then have a good view of the external genitalia and check for any irritation, redness, excoriation, bulge nodules

Examine the vulva for any sores, ulcers, swelling or discharge;

Vaginal discharges – colour, malodour, consistency

Examine the perianal region

Examine the internal surface of the labia after gently separating them.

Feel if any sores are soft or hard and if they are tender

Pelvic examination – to inspect and assess the external genitalia, perineal and anal areas, vaginal tract and cervix.

Use a speculum to examine the vagina and cervix; if there is vaginal discharge use a swab on forceps to clean the cervix and then see if there is inflammation of the cervix or if pus is coming through the cervix

Carry out bimanual examination to check for unilateral or bilateral adnexal tenderness

High vaginal swab (HVS) for culture and sensitivity

Check vital signs –

Temperature

Determine rate, rhythm and depth of respirations

Pulse

Blood Pressure

Weight – check and record

Urine for Urinalysis –

Colour, PH and specific gravity determine presence of glucose, protein, blood, ketones

Analyze sediments for cells; culture and sensitivity

Residual Urine – Amount of urine left in bladder after voiding measured via catheter.

Creatinine Clearance – determines amount of creatinine (waste product of protein breakdown) in urine over 24 hours, measures overall renal function.

Blood Studies include

Serum Creatinine – Specific test for renal disorders reflects ability of kidneys to excrete creatinine.

Electrolytes – Bicarbonate, calcium, phosphorus, sodium, potassium.

BUN – measures renal ability to excrete urea nitrogen

### 3.4 General Approach to Management

From the history and examination performed assemble the relevant findings, make a clinical judgement and locate the appropriate action in your standing orders

Generally for urinary tract infections,

- Antibiotics e.g. ampicillin, cephalosporin
- Urinary antiseptics e.g. Nitrofuratoin, nalidixic acid
- Sulphonamides e.g. trimethoprim – Sulfamethoxazole (Bactrim)
- Urinary tract analgesics (pyridium)

Force Fluids – 3000 ml daily over that of dietary intake unless contraindicated.

Proper care of the perineal area

Diet that acidifies urine should be encouraged

Sitz baths for comfort.

Follow up care for up to 1 year.

The management for enuresis

Teach bladder retention exercises, counsel on behaviour modification e.g. use of bed alarm devices.

Counsel family to give praise and support to small accomplishments and to avoid scolding and belittling the child

Menstrual abnormalities

Dysmenorrhoea – Rest – avoidance of fatigue and over exertion during the period.

Application of heat, ingestion of warm beverages before the onset of pain prevent attack.

Analgesics – especially anti prostaglandins

Amenorrhoea – This is managed according to cause.

Menorrhagia – Treatment individualized by cause. But encourage intake of foods high in iron content. Encourage planned rest periods.

Metrorrhagia – Treatment individualized by cause.

Endometriosis-

Hormonal therapy – oral contraceptive to minimize endometrial build up and medications to suppress ovulation.

Pregnancy and lactation may also be recommended as means to suppress menstruation.

Uterine fibroid Tumour – Patient is referred for confirmation of diagnosis and surgical removal.

Ovarian tumour, cancer of cervix and breast disorders is referred to specialist for management.

### Vaginal Fistula

Small fistula may heal spontaneously

Patients are referred for surgical excisions

### Cystocele and rectocele

Patient is referred for surgery

All women are encouraged to carry out Breast Self-Examination (BSE) at regular intervals.

### Infections

Patients are managed with the standing orders using the syndromic approach to management of Sexually Transmitted Infections (STIs) and lower abdominal pain in women. Some of the standard management for some of the conditions is as follows

### Vaginitis

#### Trichomoniasis

Metronidazole (flagyl) for the women and all sexual partners

Treatment lasts for seven days during which time a condom should be used for intercourse.

#### Candida Albicans

Topical application of clotrimazole, nystatin or gentian violet

Atrophic – antibiotics and oestrogen therapy.

Simple – antibiotics and sulphonamide creams.

## 4.0 CONCLUSION

This unit covered the health conditions of the female genitourinary system. We began with a review of the anatomy and physiology of the female urinary and genital organs as a basis for understanding the peculiarities and how it differs from the male genitourinary system.

The frequently encountered health conditions of women were also discussed. These conditions usually involve the reproductive organs or its accessory organs.

## 5.0 SUMMARY

In this unit we discussed the female genitourinary system. The main physiologic function is child bearing. The disorders of this system are distressing to the patient because of its interference with sexuality, conception and self-image.

## 6.0 TUTOR MARKED ASSIGNMENT

1. Discuss the similarities and differences between the male and female genitourinary system.
2. Which of the two systems is more burdened with health problems? Why is this so?

## 7.0 REFERENCE AND FURTHER READING

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## UNIT 12: HEALTH CONDITIONS OF THE ENDOCRINE SYSTEM

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#### 1.0. INTRODUCTION

In this unit, we will discuss the health conditions of the endocrine system which is composed of an interrelated complex of glands that secrete a variety of hormone directly into the blood stream. Its major function together with the nervous system is to regulate body functions. When there is a disturbance in one of the secreting glands may affect the regulation of another gland. Therefore a patient with a disturbance of this system may also experience multiple problems and needs.

#### 2.0. OBJECTIVES

By the end of this unit, you should be able to

- Describe the overview of anatomy and physiology
- Identify health conditions that result from the pathophysiology of the endocrine glands.
- Highlight the suggested history and examination to be performed for the identified conditions of the endocrine system.
- Discuss the approach to management of the conditions of the endocrine system.

#### 3.0 MAIN CONTENT

##### 3.1 Review of anatomy and physiology

The endocrine system includes pituitary, adrenal Thyroid, parathyroid, pancreas, and gonads.

The pituitary gland is located in sellaturcica at the base of the brain; it is the master gland of the body and is composed of three lobes.

- Anterior lobe (adenohypophysis) it secretes tropic hormones i.e. hormone that stimulate target organs to produce their hormone. It also secretes hormones that have direct effect on tissues.  
It is regulated by hypothalamic releasing and inhibiting factors and by negative feedback system.
- Posterior lobe (neurohypophysis) does not produce hormones. It stores and releases anti diuretic hormone an oxytocin produced by the hypothalamus.
- Intermediate lobe secretes melanocyte stimulating hormones.

Adrenal glands – these are two small glands, one above each kidney. Consist of two sections.

- Adrenal cortex (outer portion) produces mineralocorticoids glucocorticoid, sex hormones.
- Adrenal medulla (inner portion) produces epinephrine, norepinephrine.

Thyroid Gland – located in anterior portion of the neck.

Consists of two lobes connected by a narrow isthmus.

It produces thyroxine, triiodothyronine and thyrocalcitonin.

Parathyroid Glands are four small glands located in pairs behind the thyroid gland.

It produces parathormone.

Pancreas is located behind the stomach. It has both endocrine and exocrine functions.

The islets of langerhans i.e. the alpha and beta cells are involved in endocrine function.

The beta cells produce insulin and alpha cells produce glucagon.

Gonads

Ovaries – found only in females. It is located in the pelvic cavity and produce oestrogen and progesterone.

Testes – found only in males. It is located in scrotum and it produces testosterone.

Hormone Regulation

Hormones are chemical substances that act as messengers to specific cells and organs known as target organs. It stimulates and inhibits various processes.

There are two major categories.

- Local – These are hormones with specific effect in the area of secretion e.g. secretin.
- General – These are hormones transported in the blood to distant sites where they exert their effect e.g. Cortisol.

The major means of regulating hormone levels is known as the negative feedback mechanisms. Decreased concentration of a circulating hormone triggers production of a stimulating hormone from the pituitary gland. This hormone in turn stimulates its target organ to produce hormones. Increased concentration of a hormone inhibits production of the stimulating hormone, resulting in decreased secretion of the target organ hormone. Some hormones are controlled by changing blood level, of specific substances e.g. calcium, glucose. Certain hormones e.g. cortisol or female reproductive hormones follow rhythmic patterns of secretion.

The glands and the hormones secreted are as follows:

Pituitary

- Anterior lobe secretes – Thyroid stimulating hormone, adrenocorticotrophic hormone, follicle stimulating hormone, luteinizing hormone, Growth Hormone and prolactin.
- Posterior lobe secretes – antidiuretic hormone and oxytocin.
- Intermediate lobe secretes – Melanocyte stimulating hormone.

## Adrenal

- Adrenal cortex secretes mineralocorticoids (e.g. aldosterone) glucocorticoids (e.g. cortisol, corticosterone) and sex hormones (e.g. androgens, oestrogen and progesterone)
- Adrenal medulla secretes epinephrine, Norepinephrine.

Thyroid secretes T3 triiodothyronine, T4 thyroxine and thyrocalcitonin.

Parathyroid produces parathormone.

Pancreas (Islet of langerhans)

- Beta cells secretes insulin
- Alpha cell secretes glucagon

Ovaries secretes oestrogen and progesterone

Testes secrete testosterone.

### 3.2. Health Conditions of the Endocrine System.

#### **Pituitary Gland Disorders**

- **Hypopituitarism** – This is hypo function of the anterior pituitary gland resulting in deficiencies of both the hormones secreted by the pituitary gland and those secreted by the target glands.  
May be caused by tumour, trauma, surgical removal or irradiation of the gland and it may also be congenital.  
**Sign and Symptoms**  
Varying signs of hormonal disturbance depending on which hormones are being under secreted e.g. menstrual dysfunction, hypothyroidism and adrenal insufficiency. There may be retardation of growth if condition occurs before epiphyseal closure.
- **Hyperpituitarism**  
This is hyper function of the anterior pituitary gland resulting in the over secretion of one or more of the anterior pituitary hormones.  
Over production of the growth hormone produces acromegaly in adults, and gigantism in children ( if hyper secretion occurs before epiphyseal closure ).  
It is usually caused by benign pituitary adenoma.  
**Sign and Symptoms**  
Headache resulting from the tumour  
Hormonal disturbances depending on which hormones are being excreted in excess  
Acromegaly caused by over secretion of growth hormones transverse enlargement of bones especially noticeable in skull and in bones of hands and feet. Features become coarse and heavy, lips become heavier and tongue becomes enlarged.
- **Diabetes Insipidus**  
This is the hypo function of the anterior pituitary gland, resulting in deficiency of antidiuretic hormone (ADH).  
It is characterized by excessive thirst and urination.  
It is caused by the tumour, inflammation, pituitary surgery.  
**Sign and Symptoms**  
Polydipsa – excessive thirst and severe polyuria with low specific gravity.  
Fatigue, muscle weakness, irritability, weight loss, signs of dehydration.  
Tachycardia, eventual shock if fluids not replaced

## **Adrenal Gland Disorders**

- Addison's disease – This is primary adrenocortical insufficiency. There is hypo secretion of the adrenal cortex hormones which causes decrease secretion of the mineralocorticoids, glucocorticoids and sex hormones.

This is a rare disease caused by idiopathic atrophy of the adrenal cortex possibly due to an autoimmune process. It may occur as a result of destruction of gland secondary to tuberculosis or fungal infection.

Sign and Symptoms

Fatigue, muscle weakness, Anorexia, nausea, vomiting, abdominal pain, weight loss

History of frequent hypoglycaemic reactions

Hypotension, weak pulse

Bronze like pigmentation of the skin

Decreased capacity to deal with stress

## **Thyroid Gland Disorders**

- Simple goitre – enlargement of the thyroid gland not caused by inflammation or neoplasm

Types

Endemic – caused by nutritional iodine deficiency common in areas where soil and water are deficient in iodine. Occurs most frequently in adolescence and pregnancy.

Sporadic – caused by

Ingestion of large amounts of goitrogenic foods i.e. food that contains agents that decrease thyroxine production. e.g. cabbage, soybeans, peanuts, peas, strawberries, spinach.

Use of goitrogenic drugs e.g. large doses of salicylic acid, iodine, phenylbutazone.

Genetic defect that prevents synthesis of thyroid hormone.

Low levels of thyroid hormone stimulate increased secretion of thyroid stimulating hormone (TSH). The stimulation causes the thyroid to increase in size to compensate for the low levels of thyroid hormone.

Sign and Symptoms

Dysphagia

Enlarged thyroid gland

Respiratory distress

- Hypothyroidism ( Myxoedema)

Slowing of metabolic processes caused by hypo function of the thyroid gland with decreased thyroid hormone secretion. It causes myxoedema in adults and cretinism in children.

It may be caused by auto immune disease, thyroidectomy overuse of antithyroid drugs, malfunction of pituitary gland and use of radioactive iodine.

Thyroid gland fails to secrete satisfactory quantity of thyroid hormone which results in overall decrease in metabolism.

Sign and Symptoms

Fatigue, lethargy, slowed mental process, dull look, slow clumsy movements, anorexia, Weight gain, constipation, intolerance to cold, dry scaly skin, dry sparse hair, brittle nails, menstrual irregularities, generalized interstitial non-pitting oedema, bradycardia, cardiac complications, increased sensitivity to sedations, narcotics and anaesthetics.

- **Hyperthyroidism (Grave's Disease)**  
 Secretion of excessive amount of thyroid hormone in the blood causes an increase in metabolic process over activity and changes in the thyroid gland may be present.  
 Symptomatic hyperthyroidism and can also be called thyrotoxicosis.  
**Sign and Symptoms**  
 Irritability, agitation, restlessness, hyperactive movements, tremor, sweating, insomnia, increased appetite, hyperphagia, weight loss, diarrhoea, intolerance to heat, exophthalmos (protrusion of the eyeballs) goitre, warm, smooth skin, fine soft hair, pliable nails.  
 Tachycardia increased systolic blood pressure, palpitations, tachypnoea, and dyspnoea.

### **Parathyroid Glands**

- **Hyper parathyroidism**  
 Increased secretion of parathormone (PTH) that results in an altered state of calcium, phosphate and bone metabolism. It leads to bone demineralization and hypocalcaemia.  
  
 Secondary Hyperparathyroidism is caused by compensatory over secretion of PTH in response to hypocalcaemia from chronic renal disease, rickets malabsorption syndrome, osteomalacia.  
 Possible causes are chronic renal failure, bone disease benign adenomas, hypertrophy of parathyroid gland. Malignant tumours of parathyroid glands, vitamin D deficiency and malabsorption.  
**Sign and Symptoms**  
 Bone pain, (especially at back) bone mineralization  
**Pathology features**  
 Renal colic, kidney stones, polyuria, polydipsia, Anorexia, Nausea, Vomiting, Gastric Ulcers, Constipation, Muscle weakness, fatigue  
 Cardiac arrhythmias, hypertension
- **Hypoparathyroidism**  
 Disorders characterized by hypocalcaemia resulting from a deficiency of PTH production.  
 Maybe hereditary, idiopathic or caused by accidental damage to or removal of parathyroid glands during surgery e.g. thyroidectomy  
**Sign and Symptoms**  
 For acute hypocalcaemia (tetany)  
 Tingling of fingers and around lips; laryngospasm, seizures, cardiac arrhythmias.  
 For chronic hypocalcaemia  
 Fatigue, weakness, muscle cramps, personality changes, irritability, memory impairment, dry scaly skin, hair loss, loss of tooth, enamel tremor, cardiac arrhythmias cataract formation.

### **Pancreas Disorder**

- **Diabetes Mellitus** – This represents a heterogeneous group of chronic disorders characterized by hyperglycaemia.  
  
 Hyperglycaemia is due to total or partial insulin deficiency or insensitivity of the cells to insulin. It occurs when there is more glucose in the blood than is normal and the blood sugar stays at these abnormally high levels. Rising or high glucose would normally make the pancreas make and release insulin into the blood which would cause the body cells to take the glucose out of the blood into them, lowering blood sugar.

Diabetes occurs when there is an abnormality of the pancreas so that it cannot make enough insulin. It can also occur if there is an abnormality in the body cells so that they are partially resistant to the action of insulin and need large amount of insulin in the blood to make the sugar out of the blood.

Lack of insulin affects not only glucose in the body but also other carbonhydrates, fats, protein, water and electrolytes.

#### Types of Diabetes

- Type 1 (Insulin dependent diabetes mellitus)  
Usually occurs in children or in non-obese adults and is secondary to destruction of beta cells in the islets of Langerhans in the pancreas resulting in little or no production of insulin.
- Type II (Non-insulin dependent diabetes mellitus)  
Usually occurs in obese adults over 40. It may result from a partial deficiency of insulin production and / or an insensitivity of the cell to insulin.  
Lack of insulin causes hyperglycaemia which leads to osmotic diuresis as large amounts of glucose pass through the kidney results in polyuria and glycosuria.  
Diuresis leads to cellular dehydration and fluid and electrolyte depletion causing polydipsia (excessive thirst)  
Polyphagia (Increased appetite and hunger) results from cellular starvation.  
The body turns to fats and proteins for energy. But in the absence of glucose in the cell, fat cannot be completely metabolized and ketones (intermediate products of fat metabolism) are produced. This leads to ketonuria.

#### Sign and Symptoms

##### All types

Polyuria, polydipsia, polyphagia, fatigue, blurred vision, susceptibility to infection

Type I – Anorexia, vomiting, weight loss.

Type II – Obesity, but frequently no other symptom.

### 3.3. History taking for disorders of the Endocrine System.

Presenting Problem – Symptoms may include

Change in appearance – hair, nails, skin (changes in texture or pigmentation), and change in size, shape or symmetry of head, neck, face, eyes or tongue

Change in energy level

Temperature intolerance

Development of abnormal secondary sexual characteristics; Change in sexual function.

Change in emotional state, thought patten or intellectual functioning.

Signs of increased activity of sympathetic nervous system (e.g. nervousness, palpitations, tremors, sweating)

Change in bowel habits, appetite or weight, excessive hunger or thirst.

Change in urinary pattern.

Lifestyle - any increased stress.

Past medical history – growth and development (any delayed or excessive growth) diabetes, thyroid disease, hypertension, obesity, infertility

Family History – Endocrine diseases, growth problems, obesity, mental illness

#### Physical Examination

Check height, weight, body stature and body proportions.

Observe distribution of muscle mass, fat distribution any muscle wasting.  
Inspect for hair growth and distribution.

Check for condition and pigmentation of skin. Presence of striae

Inspect eye for any bulging.

Observe for enlargement in neck area and quality of voice

Observe development of secondary sex characteristics.

Palpate thyroid gland. (Normally cannot be palpated) Note size, shape, symmetry, and any tenderness, presence of any lumps or nodules.

Laboratory investigation - Urine for sugar, blood for fasting blood sugar, serum blood studies for T4 and T3 levels

### 3.4. Management

Pituitary gland, adrenal, thyroid and parathyroid glands disorders patients with these disorders are referred to a specialist for management. Follow up treatment can be continued at the Primary Health Care Level.

#### Diabetes Mellitus

If there is glucose in urine, refer the patient to a doctor for confirmation of the diagnosis and treatment which can be continued at PHC level. The treatment for diabetes includes-

The patient should have a diet containing a little refined sugar and fat as possible. Most traditional village diets except for sugar cane and sweet fruits are usually all right. The patient should eat enough food to be at the normal weight for his height and age. Then the patient should eat only enough to remain at this normal weight.

The patient should have daily physical exercise.

For insulin - dependent diabetes, insulin injection is administered daily according to prescription. It should not be stopped even if the patient gets sick or has gastroenteritis. If sick or vomiting, continue the insulin and give intravenous 4.3% dextrose in 0.18% sodium chloride before you refer.

Non-insulin – dependent diabetes mellitus, patients may be given tablets such as tolbutamide or glibenclamide if diet alone does not control their condition.

Treat any complications quickly and properly. If patient is on treatment for diabetes with insulin or tablets, and develops any of these – weakness, sweating, shaking, mental abnormality or unconsciousness do blood glucose estimation. If blood glucose is low, give two large spoonful of sugar in water by mouth.

If blood glucose is high start intravenous 0.9% sodium chloride and give a dose of unmodified or clear or soluble insulin 10 – 20 units.

If blood sugar test is not possible, first of all try the effect of the glucose and if this is not effective put the drip but do not give extra insulin.

In all cases urgently refer.

### 4.0 CONCLUSION

Endocrine glands are glands that make secretions that flow into the blood. These secretions are called hormones. Hormones means messenger.

Diseases of the endocrine glands cause symptoms and signs in three ways.

The three ways are

- Secretion of less hormones
- Secretion of more hormones than needed
- Effect of disease conditions on the glands.

Most of the diseases of the endocrine gland will need to be referred to a hospital for confirmation of diagnosis, commencement of treatment which may be continued at the PHC level.

## 5.0 SUMMARY

In this unit, we discussed the disorders of the endocrine gland. They are pituitary, adrenals thyroid, parathyroid, islets of Langerhans of the pancreas. Disorders of ovaries and testes will be discussed under the reproductive system. Out of all these the pituitary is the master gland as all glands depend on hormone form it for their stimulation.

The disturbance in one of the secreting glands may affect the regulation of another gland, therefore the patient with a disturbance of this system will experience multiple problems and needs.

## 6.0 TUTOR MARKED ASSIGNMENT

Find out the area(s) where goitre and diabetes mellitus is prevalent in Nigeria

Explain the conditions in that area that is responsible for this.

## 7.0 REFERENCE AND FURTHER READING

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## UNIT 13: DISORDERS OF THE EAR AND THROAT

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  - 3.5 Management approach to ear and throat disorders
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### 1.0 INTRODUCTION

In this unit, we will consider the disorders of the ear and throat. The disorders of the nose were discussed under the respiratory system. These organs are linked together and problem in one of them can cause symptoms in the other two.

### 2.0 OBJECTIVES

By the end of this unit, you will be able to

- Give the overview of anatomy and physiology of the ear
- Describe the disorders of the ear
- Discuss the disorders of throat
- Explain the management approach to ear and throat disorders

### 3.0 MAIN CONTENT

#### 3.1 Overview of anatomy and physiology of the ear

The ear is the organ of hearing and balance. It is divided into three parts, the external, middle, and inner ear. The external ear collects sound, the middle ear contains small bones that amplify and transmit it, while the inner ear maintains balance and contains sensory nerve endings for detecting sound.

The outer ear is the most external portion of the ear. The outer ear includes the pinna (also called auricle), the ear canal, and the very most superficial layer of the ear drum (also called the tympanic membrane). The only visible portion of the ear is the outer ear. Although the

word "ear" may properly refer to the pinna (the flesh covered cartilage appendage on either side of the head), this portion of the ear is not vital for hearing. The outer ear does help get sound (and imposes filtering), but the ear canal is very important. Unless the canal is open, hearing will be dampened. Ear wax (cerumen) is produced by glands in the skin of the outer portion of the ear canal. This outer ear canal skin is applied to cartilage; the thinner skin of the deep canal lies on the bone of the skull. Only the thicker cerumen-producing ear canal skin has hairs. The outer ear ends at the most superficial layer of the tympanic membrane. The tympanic membrane is commonly called the ear drum. The pinna helps direct sound through the ear canal to the tympanic membrane (eardrum).

The middle ear, an air-filled cavity behind the ear drum (tympanic membrane), includes the three ear bones or ossicles: the malleus (or hammer), incus (or anvil), and stapes (or stirrup). The opening of the Eustachian tube is also within the middle ear. The Eustachian tube connects from the chamber of the middle ear to the back of the pharynx. The malleus has a long process (the manubrium, or handle) that is attached to the mobile portion of the eardrum. The incus is the bridge between the malleus and stapes. The stapes is the smallest named bone in the human body. The three bones are arranged so that movement of the tympanic membrane causes movement of the malleus, which causes movement of the incus, which causes movement of the stapes. When the stapes footplate pushes on the oval window, it causes movement of fluid within the cochlea (a portion of the inner ear).

The inner ear includes both the organ of hearing (the cochlea) and a sense organ that is attuned to the effects of both gravity and motion (labyrinth or vestibular apparatus). The balance portion of the inner ear consists of three semi-circular canals and the vestibule. The inner ear is encased in the hardest bone of the body. Within this ivory hard bone, there are fluid-filled hollows. Within the cochlea are three fluid filled spaces: the tympanic canal, the vestibular canal, and the middle canal. The eighth cranial nerve comes from the brain stem to enter the inner ear.

Ear wax: The ear canal is shaped somewhat like an hourglass. The skin on the outer part of the canal has special glands that produce earwax. The purpose of this natural wax is to repel water and to trap dust and sand particles. Usually a small amount of wax accumulates, and then dries up and falls out of the ear canal caring with it unwanted particles. Ear wax is helpful in normal amounts and serves to coat the skin of the ear canal where it acts as a temporary water repellent. The absence of ear wax may result in dry, itchy ears, and even infection

The pharynx is the throat – the region of the alimentary canal that lies between the mouth and oesophagus. Air leaves the nasal passages and flows to the pharynx, a short, and funnel-shaped tube about 13 cm (5 in) long that transports air to the larynx. Like the nasal passages, the pharynx is lined with a protective mucous membrane and ciliated cells that remove impurities from the air. In addition to serving as an air passage, the pharynx houses the tonsils, lymphatic tissues that contain white blood cells. In their battles with disease-causing organisms, the tonsils sometimes become swollen with infection. When the adenoids are swollen, they block the flow of air from the nasal passages to the pharynx, and a person must breathe through the mouth.

### 3.2 Disorders of ear

#### **Earache Overview**

Earache is very common medical problem for both children and adults.

The 2 most common conditions that cause earache are infection of the outer ear (otitis externa) and infection of the middle ear (otitis media).

- Otitis externa - Skin infection of the outer ear or ear canal  
Often occurs after swimming (commonly called swimmer's ear) or bathing or sometimes just from hot humid weather

The 2 common causes of otitis externa are

Trapped moisture - bacteria that cause the infection are able to grow and multiply easily in the warm moist environment

Minor injury or scrape to the ear canal skin - This usually happens during attempts to clean the ear with objects, such as a cotton-tipped swab or paper clip. The break in the skin allows bacteria to penetrate and start an infection.

- Otitis media- this refers to infection of the middle ear and eardrum. Very common in infants and children aged 6 months to 2 years can also affect older children and adults

Otitis media is caused by bacteria growing in the middle ear behind the eardrum. It often follows a cold or upper respiratory tract infection.

The Eustachian tube, that connects the middle ear to the nose helps drain extra fluid from the middle ear.

Cold causes swelling at the back of the nose which may impede the ear normal drainage.

If the Eustachian tube does not function properly, fluid can become trapped behind the eardrum. Pathogenic organisms (either viruses or bacteria) grow in that fluid, and then infection occurs.

#### Risk factors

Allergies

Day-care centres

Second-hand smoke exposure

Bottle (rather than breast) feeding

Family history of ear infections

Malformations of the head and neck area

#### Signs and symptoms

Typically, there is an earache, which can be severe. Touching or pulling on the ear worsens the pain.

Hearing loss

Ringing or buzzing sounds in the ear

Full or plugged sensation in the ear

Swelling of the ear

Thick drainage from the ear

Fever

Many children who develop ear infections will first have colds. Other symptoms in infants - Vomiting or diarrhoea, Irritability, Poor feeding, Poor sleeping

**Foreign object in the ear** i.e. foreign object in the external ear canal – Foreign objects are often placed in the ear by young children or by accident while trying to clean or scratch the ear. There is often an accompanying external ear infection.

Insects or bugs may also become trapped in the ear. Small gnats may become caught in the wax and cannot fly out. They can often be washed out with warm water. Larger insects or bugs may not be able to turn around in the narrow canal. If the insect or bug is still alive, first kill it by filling the ear with mineral oil. This will suffocate the insect.

**Benign positional vertigo (BPV)** – (or simply vertigo) is a disorder of the inner ear. You feel a sudden sensation of movement or spinning when you move your head or hold it in a certain position.

The inner ear is located within your skull and consists of the cochlea, a chamber shaped like a snail shell, where sound is transformed to nerve signals for the brain, and 3 semi-circular canals that function like a gyroscope, relaying information about head position and movement to the brain.

The semi-circular canals contain fluid and special sensors that, when disturbed, inform the brain of a change in head position. It is thought that when you have BPV small particles become dislodged within the inner ear and then bounce around when your head moves, triggering faulty signals that your head is still moving even after it stops. This sensation of movement or imbalance when you are not moving is called vertigo, the primary symptom of benign positional vertigo.

## **Hearing Loss**

To understand hearing loss it is important to understand how normal hearing takes place. There are 2 different pathways by which sound waves produce the sensation of hearing: air conduction and bone conduction.

In air conduction, sound waves move through the air in the external auditory canal (the "ear canal" between the outside air and your eardrum). The sound waves hit the tympanic membrane (eardrum) and cause the tympanic membrane to move.

The bones in the middle ear are connected to the tympanic membrane. When the tympanic membrane moves, this movement is transmitted to the bones. These 3 bones are called the malleus, the incus, and the stapes. Movement of the stapes causes pressure waves in the fluid-filled inner ear.

The cochlea is an inner ear structure surrounded by fluid. It contains multiple small hairs. Pressure waves in the fluid cause the hairs to move. This movement stimulates the auditory nerve. Different frequencies of noises stimulate different hairs on the cochlea, which translate to the sensation of sounds of different pitch.

Hearing by bone conduction occurs when a sound wave or other source of vibration causes the bones of the skull to vibrate. These vibrations are transmitted to the fluid surrounding the cochlea and hearing results.

### **Causes of Hearing Loss**

There are 2 basic types of hearing loss, which are called conductive and sensorineural. Conductive causes: Conductive hearing losses result from physical problems with the movement of the sound wave through the ear. A simple example is blockage of the ear canal.

Obstructed external ear canal - Cerumen (wax) build-up, hematoma (blood collection), or foreign body in the ear canal. This is one of the most common causes of hearing loss and the easiest to fix.

Perforated tympanic membrane - Caused by direct trauma such as a finger or cotton swab, middle-ear infections (otitis media), or explosions (blast injury)

Dislocated ossicle (malleus, incus, or stapes) - Usually from trauma to the ear

Otitis media - Middle ear infection

Otitis externa - Infection of the ear canal that causes it to swell

Sensorineural causes:

Sensorineural causes are from damage to the hair cells or nerves that sense sound waves.

Acoustic trauma - Prolonged exposure to loud noises causes the hair cells on the cochlea to become less sensitive.

Barotrauma (pressure trauma) or ear squeeze - Usually in divers

Head trauma - A fracture of the temporal bone can disrupt the nerves of the auditory system

Ototoxic drugs - Certain drugs can affect hearing by damaging the nerves involved in hearing. Usually this occurs when large or toxic doses are used but may also occur with

lower doses. e.g. Antibiotics including aminoglycosides (gentamicin, vancomycin), erythromycins, and minocycline

Diuretics including furosemide and ethacrynic acid

Salicylates (aspirin) and nonsteroidal anti-inflammatory (NSAIDs) such as ibuprofen and naproxen

Antineoplastics (cancer drugs)

Vascular diseases (problems with blood vessels) include sickle cell disease, diabetes, leukaemia, polycythaemia, and diseases in which excessive blood clotting occurs.

Children and adults with kidney problems are more susceptible to sensorineural hearing loss

Acoustic neuroma - A tumour in the auditory nerve, usually associated with ringing in the ears.

Infections e.g. Mumps, Measles, Influenza, Herpes simplex, Herpes zoster, Syphilis

Meningitis

Aging (presbycusis)

Hearing Loss Symptoms

Hearing loss may be gradual or sudden, may be very mild, resulting in minor difficulties with conversation, or as severe as complete deafness. The speed with which hearing loss occurs may give clues as to the cause.

If hearing loss is sudden, it may be from trauma or a problem with blood circulation. A gradual onset is suggestive of other causes such as aging or a tumour.

If you also have other associated neurological problems, such as tinnitus (ringing in the ears) or vertigo (spinning sensation), it may indicate a problem with the nerves in the ear or brain.

Hearing loss may be unilateral (only 1 ear) or bilateral (both ears). Unilateral hearing loss is most often associated with conductive causes, trauma, and acoustic neuromas.

Pain in the ear is associated with ear infections, trauma, and obstruction in the canal.

Ear infections may also cause a fever.

### 3.3 **Throat disorders**

- Sore throat

A sore throat or throat pain is pain anywhere in the oropharynx. It is a common physical symptom usually caused by acute pharyngitis, or throat inflammation, however occurs from a number of other situations such as post trauma. It can be extremely painful

Causes of sore throat

Sore throat may have many causes. The most common causes of sore throat are infections of the throat and the surrounding structures. Any inflammation or infection of the pharynx, tonsils, oesophagus or larynx may cause sore throat.

- Tonsillitis

The tonsils are red, oval clumps of tissue located at the back and to the sides of the throat. This location allows the tonsils to intercept germs as they enter the body through the nose and throat.

When the tonsils become red, sore, and swollen, this inflammation is called tonsillitis. This is not a specific term, as there are many causes of inflammation of the tonsils. Tonsillitis is a common cause of sore throat.

- Pharyngitis

An infection or inflammation of the pharynx is called pharyngitis. The infectious causes are similar to those causing tonsillitis, which are mainly related to viruses and less commonly to bacterial infection.

- Tonsillopharyngitis

Because it is difficult to always distinguish exactly between pharyngitis and tonsillitis, throat infections are commonly referred to as tonsillopharyngitis, which signifies an infection of the tonsils, or pharynx, or both

The most common way to catch strep throat is by contact with an infected person. A person with an active infection of streptococcus may be contagious by contact. This is the most frequent mode of transmission and frequently occurs in families or in schools.

Signs and symptoms

Symptoms of strep throat may vary quite a bit depending on the patient's age.

Infants primarily experience a thick "colourful" (yellow or green) drainage from the nose and possibly a low-grade fever, with fussiness, irritability, and a decrease in appetite.

Children aged one to three ("toddlers") may complain of a sore throat, trouble swallowing, poor appetite, crankiness, and swollen glands (lymph nodes) beneath the jaws.

Older children and adolescents generally look and feel awful with strep throat. They can have high fevers, very painful throats, often severe difficulty swallowing, and pus, which can sometimes be seen covering the tonsils.

Symptoms vary; adults may also have severe pain and trouble swallowing; Adults with strep throat may have milder symptoms, and in some cases the illness may be undetected.

### 3.4 Detailed history and examination

Ascertain the client's age and locate the appropriate section in your standing orders and then obtain the complaints

Look up the client's condition under the table of content of the section which could be ear problems, throat problems and turn to the appropriate page of your standing orders

Take the detailed history as follows:

Ask about the presenting symptom – pain in the ear; difficulty in swallowing;

Ask about any other symptom like runny nose, headache, fever, cough, diarrhoea or vomiting

For how long has he been ill?

Is there discharge of pus, water or blood from the ear? If so, for how long and was there any previous episode?

Was there any foreign body or have you put something in the ears? Has there been any blow or injury to the ears or head?

Did you notice any hearing loss? (Does the patient work with noisy machinery or in a noisy place?)

Examination will be carried out as follows-

General appearance – check whether ill looking or in pain or irritable

Neck – Palpate for enlarged lymph nodes or swelling; examine for stiffness

Examination of the ear

Examine the mastoid bone behind the ear for tenderness

In these settings you will most likely evaluate hearing with a tuning fork or by clapping.

Each ear will be tested separately to see if you can hear the sound coming from a tuning fork.

The ear canal and tympanic membrane will be inspected with an otoscope to check the condition of the canal; pus or blood from the ear; perforated, red or bulging ear drum; presence of cerumen or foreign body

Examination of the throat

Look at the mouth with a tongue depressor and light to detect any throat redness, or white patches exudate on the tonsils

Temperature – check and record

### 3.5 Management of ear and throat problems

From the history and examination performed assemble the relevant findings, make a clinical judgement and locate the appropriate action in your standing orders. However, the procedures for the management of some of the identified health conditions are as follows:

The following are to guide your management  
Give analgesics to relieve pain, antibiotics to treat the infection  
Use of salt water to gargle or throat lozenges  
If a foreign body is found in the ear canal, refer  
When the cause of the hearing loss is unknown, refer.  
Advice patient not to use cotton swabs to probe into or clean the ear canal; and not place cotton balls and liquids into the ear canal.  
If associated symptoms are troublesome (e.g. if there is tinnitus, vertigo), anti-anxiety or motion sickness medication may be prescribed.

#### 4.0 CONCLUSION

The ear is the organ of hearing and balance. It is divided into three parts, the external, middle, and inner ear.

The external ear collects sound, the middle ear contains small bones that amplify and transmit it, while the inner ear maintains balance and contains sensory nerve endings for detecting sound which is the means of auditory communication.

The word "ear" may be used correctly to describe the entire organ or just the visible portion on each side of the head as a flap of cartilage with skin surrounding or covering it. The common ear problems are otitis externa & media, vertigo and hearing loss.

The structures in the throat include the pharynx and tonsils. Inflammation of these results in sore throat.

#### 5.0 SUMMARY

In summary, the ear is the auditory sense organ. The two different pathways by which sound waves produce the sensation of hearing are air conduction and bone conduction. The two basic types of hearing loss are conductive and sensorineural. The common infection of the ear was discussed to include otitis media and externa.

Tonsillopharyngitis, signifies an infection of the tonsils, or pharynx, or both.

Disorders of the ear and throat are managed with the standing orders

#### 6.0 TUTOR MARKED ASSIGNMENT

Enumerate the common ear problems

What are the causes?

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## UNIT 14: DISORDERS OF THE EYE

### TABLE OF CONTENTS

- 1.0 Introduction
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### 1.0 INTRODUCTION

Eye is a light-sensitive organ of vision. The eyes of various species vary from simple structures that are capable only of differentiating between light and dark, to complex organs that can distinguish minute variations of shape, colour, brightness, and distance. The actual process of seeing is performed by the brain rather than by the eye. The function of the eye is to translate the electromagnetic vibrations of light into patterns of nerve impulses that are transmitted to the brain

### 2.0 OBJECTIVES

By the end of this unit, you will be able to

- Give the overview of anatomy and physiology of the eye
- Describe the disorders of the eye
- Highlight the history and examination for eye disorders
- Explain the management approach to eye disorders

### 3.0 MAIN CONTENT

#### 3.1 Overview of anatomy and physiology of the eye

The eye is the organ of vision and has both external and internal structures.

The external structures

- Eyelids and eye lashes which protect the eye from foreign particles.
- Conjunctiva – the palpebral conjunctiva and bulbar conjunctiva.  
The palpebral conjunctiva is pink and lines the inner surface of the eyelid.  
The bulbar conjunctiva is white with small blood vessels. It covers the anterior sclera
- Lacrimal apparatus consists of lacrimal gland, its ducts and passages. It produces tears to lubricate the eye and moisten the cornea. Tears drain into nasal cavity
- Movement of the eye is controlled by six extra-ocular muscles

The internal structures

The eyeball made up of three layers of as follows

Outer layer

Sclera - this is a tough, white connective tissue (white of the eye) located anteriorly and posteriorly

Cornea – a transparent tissue through which light enters the eye. It is located anteriorly.

Middle layer include

Choroid- a highly vascular layer that nourishes the retina. It is located posteriorly.

Ciliary body- anterior to choroid secretes aqueous humour. The muscles change shape of lens.

Iris- the pigmented membrane behind the cornea. It gives colour to the eye. It is located anteriorly. Pupil is a circular opening in the middle of the iris that constricts or dilates to regulate the amount of light entering the eye.

Inner layer- retina

Light-sensitive layer composed of rods and cones (visual cells)

Cones are specialized for fine discrimination and colour vision.

Rods- are more sensitive to light than cones and it aids peripheral vision.

Optic disk – an area in the retina for entrance of optic nerve. It has no photoreceptors

Lens – the transparent body that focuses image on the retina

Fluids of the eye

- Aqueous humour – clear watery fluid in anterior and posterior chambers anterior part of the eye. Serves as refracting medium and provides nutrient to lens and cornea. It contributes to maintenance of intraocular pressure
- Vitreous humour – clear gelatinous material that fills posterior cavity of the eye.

Visual Pathways

Retina (rods and cones) translates light waves into neural impulses that travel over the optic nerves.

Optic nerve for each eye meets at the optic chiasm

Fibres from median halves of the retina cross here and travel to opposite side of the brain.

Fibres from lateral halves of retina remain uncrossed.

Optic nerves continue from optic chiasm as optic tract and travel to the cerebrum (occipital lobe) where visual impulses are perceived and interpreted.

### 3.2 Disorders of the eye

#### **Trachoma**

This is a contagious infection of the conjunctivae and cornea of the eye caused by *Chlamydia trachomatis*. It is spread by direct contact with eye, nose, and throat secretions from affected individuals, or contact with fomites (inanimate objects), such as towels and/or washcloths, that have had similar contact with these secretions. Flies can also be a route of mechanical transmission. Untreated, repeated trachoma infections result in entropion—a painful form of permanent blindness when the eyelids turn inward, causing the eyelashes to scratch the cornea. Children are the most susceptible to infection due to their tendency to easily get dirty, but the blinding effects or more severe symptoms are often not felt until adulthood.

Blinding endemic trachoma occurs in areas with poor personal and family hygiene. Many factors are indirectly linked to the presence of trachoma including lack of water, absence of latrines or toilets, poverty in general, flies, close proximity to cattle, crowding etc. However, the final common pathway seems to be the presence of dirty faces in children that facilitates

the frequent exchange of infected ocular discharge from one child's face to another. Most transmission of trachoma occurs within the family.

Trachoma is a major cause of blindness

### Signs and Symptoms

The disease begins after an incubation period of five to seven days with inflammation of the eye. It is characterized by hard pustules or granular excrescences on the inner surface of the eyelids, inflammation of the membrane, and subsequent involvement of the cornea.

Ensuing symptoms are – considerable discharge of pus, swelling of the lids, tearing, and increased sensitivity to light. It goes on in a few weeks to chronic swelling, formation of blisters in the eye, and destruction and scarring of the cornea, which eventually causes blindness. In its early stages trachoma responds readily to the topical, and sometimes oral, administration of broad-spectrum antibiotics.

### Conjunctivitis

This is inflammation of the conjunctiva, a mucous membrane that lines the inner surface of the eyelids and joins with the cornea of the eyeball.

Conjunctivitis may be caused by either bacterial or viral infection which is often epidemic, allergy, or injury. The acute form of conjunctivitis is commonly called pinkeye. In new-born babies it may result from several kinds of cocci, especially the gonococcus (gonorrhoeal conjunctivitis).

Conjunctivitis caused by exposure of the eye to a welding arc or other source of ultraviolet rays is called flash kerato-conjunctivitis

The spread of most infectious types of conjunctivitis is by direct or indirect contact or through a vector.

### Signs and Symptoms

It is marked by redness and swelling, accompanied by a feeling of roughness as the membrane passes over the exposed surface of the eyeball. The eye may be sensitive to light. In more severe cases a mucoid sticky fluid, or even pus, may be discharged, depending on the cause of the infection.

### Stye

This is an inflammation of one or more of the sebaceous (oil-producing) glands of the eyelid, usually caused by a bacterial infection. It typically develops on the edge of the eyelid around the base of an eyelash.

### Causes

Styes are commonly caused by a *Staphylococcus aureus* bacterial infection, or by the blocking of an oil gland at the base of the eyelash. Although they are particularly common in infants, styes are experienced by people of all ages. It can be triggered by poor nutrition, sleep deprivation, excessive butterfly kissing, or rubbing of the eyes. Using the same razor to shave hair near both the eyes and a moustache can also spread staphylococcus bacteria, potentially leading to styes or other eye infections.

Styes will last from up to one to 2 weeks without treatment and only up to 4 days if treated properly.

### Signs and symptoms

The first sign of a sty is a small, yellowish spot at the centre of the bump that develops as pus expands in the area.

Other stye symptoms may include:

A lump on the top or bottom eyelid

Localized swelling of the eyelid  
Pain which becomes more intense if the pus ruptures  
Redness  
Tenderness to touch  
Crusting of the eyelid margins  
Burning in the eye  
Droopiness of the eyelid  
Scratchy sensation on the eyeball  
Blurred vision  
Mucous discharge in the eye  
Light sensitivity  
Tearing  
Discomfort during blinking  
Sensation of a foreign body in the eye

### **Glaucoma**

Glaucoma is a disease in which the optic nerve is damaged, leading to progressive, irreversible loss of vision. It is often, but not always, associated with increased pressure of the fluid in the eye.

The nerve damage involves loss of retinal ganglion cells in a characteristic pattern. There are many different sub-types of glaucoma but they can all be considered as a type of optic neuropathy. Raised intraocular pressure is a significant risk factor for developing glaucoma. One person may develop nerve damage at a relatively low pressure, while another person may have high eye pressure for years and yet never develop damage. Untreated glaucoma leads to permanent damage of the optic nerve and resultant visual field loss, which can progress to blindness.

Glaucoma can be divided roughly into two main categories, "open angle" and "closed angle" glaucoma. Closed angle glaucoma can appear suddenly and is often painful; visual loss can progress quickly but the discomfort often leads patients to seek medical attention before permanent damage occurs. Open angle, chronic glaucoma tends to progress more slowly and the patient may not notice that they have lost vision until the disease has progressed significantly.

Worldwide, it is the second leading cause of blindness.

If the condition is detected early enough it is possible to arrest the development or slow the progression with medical and surgical means.

### **Causes**

The front part of the eye is filled with a watery fluid, known as the aqueous humour. This fluid helps the eye maintain its shape and delivers oxygen and nutrients to the cornea and the lens, the eye structure that refracts light to form images. The aqueous humour is produced by the ciliary body, a small gland located just behind the lens. The fluid percolates through the pupil and circulates through the front chamber of the eye. It then drains away through a network of tiny channels, called the trabecular meshwork, located at the front of the eye where the cornea and iris meet.

When the aqueous humour does not drain properly, the fluid backs up, causing the pressure inside the eye to increase, and glaucoma develops. The increased pressure inside the eye compresses and damages the optic nerve, the bundle of nerve cells that transmit visual information from the eye to the brain. This damage to the optic nerve results in vision loss.

### Signs and symptoms

There are rarely any symptoms in the early stages of the disease so regular eye checks by qualified professionals are important. Ophthalmologists and optometrists will diagnose glaucoma on the basis of intraocular pressure, visual field tests and optic nerve head appearance.

Patients will sometimes notice patchy loss of peripheral vision or reduced clarity of colours and these people may benefit from a review by an eye specialist.

Symptoms of angle closure glaucoma can include pain in or around the eye ball, headache, nausea/vomiting and visual disturbances, for example halos around lights. In some cases there are no symptoms.

### **Cataract**

This is a clouding that develops in the crystalline lens of the eye or in its envelope, varying in degree from slight to complete opacity and obstructing the passage of light. Early in the development of age-related cataract the power of the lens may be increased, causing near-sightedness (myopia) and the gradual yellowing and opacification of the lens may reduce the perception of blue colours. Cataracts typically progress slowly to cause vision loss and are potentially blinding if untreated. The condition usually affects both the eyes, but almost always one eye is affected earlier than the other.

Cataracts may be partial or complete, stationary or progressive, hard or soft.

There are various types of cataracts, e.g. nuclear, cortical, mature, and hypermature. Cataracts are also classified by their location, e.g. posterior (classically due to steroid use and anterior (common (senile) cataract related to aging).

### Causes

Cataracts develop for a variety of reasons, including long-term exposure to ultraviolet light, exposure to radiation, secondary effects of diseases such as diabetes, hypertension and advanced age, or trauma (possibly much earlier); they are usually a result of denaturation of lens protein. Genetic factors are often a cause of congenital cataracts and positive family history may also play a role in predisposing someone to cataracts at an earlier age, a phenomenon of "anticipation" in pre-senile cataracts. Cataracts may also be produced by eye injury or physical trauma. A study among Iceland air pilots showed commercial airline pilots are three times more likely to develop cataracts than people with non-flying jobs. This is thought to be caused by excessive exposure to radiation coming from outer space. Cataracts are also unusually common in persons exposed to infrared radiation, such as glassblowers who suffer from "exfoliation syndrome". Exposure to microwave radiation can cause cataracts. Atopic or allergic conditions are also known to quicken the progression of cataracts, especially in children.

Some drugs can induce cataract development, such as corticosteroids.

### Signs and symptoms

As a cataract becomes more opaque, clear vision is compromised. A loss of visual acuity is noted. Contrast sensitivity is also lost, so that contours, shadows and colour vision are less vivid. Veiling glare can be a problem as light is scattered by the cataract into the eye. A contrast sensitivity test should be performed and if a loss in contrast sensitivity is demonstrated an eye specialist consultation is recommended.

In the developed world, particularly in high-risk groups such as diabetics, it may be advisable to seek medical opinion if a 'halo' is observed around street lights at night, especially if this phenomenon appears to be confined to one eye only.

## **Corneal ulcer**

A corneal ulcer or ulcerative keratitis, or eyesore is an inflammatory or more seriously, infective condition of the cornea involving disruption of its epithelial layer with involvement of the corneal stroma. It is a common condition in humans particularly in the tropics and the agrarian societies. In developing countries, Children afflicted by Vitamin A deficiency are at high risk for corneal ulcer and may become blind in both eyes, which may persist lifelong.

### **Symptoms**

Corneal ulcers are extremely painful due to nerve exposure, and can cause tearing, squinting, and vision loss of the eye. There may also be signs of anterior uveitis, such as miosis (small pupil), aqueous flare (protein in the aqueous humour), and redness of the eye. An axon reflex may be responsible for uveitis formation — stimulation of pain receptors in the cornea results in release inflammatory mediators such as prostaglandins, histamine, and acetylcholine.

**Xerophthalmia** (Greek word for dry eyes) is a term that usually implies a destructive dryness of the conjunctival epithelium due to dietary vitamin A deficiency — a rare condition in developed countries, but still causing much damage in developing countries.

It is a medical condition in which the eye fails to produce tears.

Xerophthalmia is caused by a severe vitamin A deficiency described as pathologic dryness of the conjunctiva and cornea. The conjunctiva becomes dry, thick and wrinkled. If untreated, it can lead to corneal ulceration and ultimately in blindness as a result of corneal damage.

### 3.3 History and examination of eye disorders

The detailed history will be obtained as follows

What is the problem with the eyes? Presenting problem may include loss of vision, blurred vision, decreased vision, double vision (diplopia)

Pain, redness, excessive tearing, sticky eye (from pus)

How long have you had the problem and have you had it before?

Did the problem come suddenly or gradually?

Is there a lot of pain in the eye?

Do your eyes itch?

Did anything enter into the eye?

Has any medicine been applied to the eyes? If so, what did you put?

If adult, ask if there is high blood pressure, diabetes or any other disease; ask if he smokes or drinks alcohol a lot

If a child, ask if the child has runny nose and cough with prolonged bouts of coughing

Does anyone else in the family have the problem?

Use of eye glasses, contact lens. Date of last eye examination

Life style – occupation, exposure to fumes, smoke or eye irritant; Use of safety glasses

Nutrition – does he take food rich in vitamin A e.g. palm oil, carrot, fresh mangoes, pawpaw, tomatoes

Use of medications (cortisone preparation may contribute to glaucoma and cataracts)

Past medical history – systemic disease, previous childhood or adult eye disorders, eye trauma

Family history – many eye disorders may be inherited

Detailed examination is as follows

General appearance – check whether ill, in pain, thin or wasted

Examine the skin for rashes and scratch marks

Examine the eyes as follows:

For redness – where the redness is – is it around the edges or in a circle at the edge of the coloured part or all over; is there bleeding into the white part of the eye

Check if it is watery; if the eye is protruding; and if there is any squint

Any swelling around the eye

Check the eyelids – if sticky; any eversion or inversion; if there is pus or any other discharges

Check the eyelashes – if regular or irregular; is it missing or touching the surface of the eye balls

Check the pupils – whether normal or small in size or equal; whether it is reactive to light; check for cloudiness or whiteness of pupil(s)

Test of vision – Visual acuity using the Snellen's chart;

Nose – for catarrh

Blood pressure – measure and record

Urine testing – for sugar

### 3.4 Management of eye disorders

After taking the history and performed the necessary examination, you will assemble the relevant findings and make a clinical judgement and take appropriate action from the standing order on eye problem.

There are some preventive and precautionary measures that should be taken for patients with eye disorders.

- Always look for foreign body in the eye. This is especially important if the eye is red and painful
- If an infection is present, use any antibiotic ointment in the eye. Remember that sulphacetamide is not very strong in killing organisms but it is usually soothing.
- If an eye infection is serious, chloramphenicol is the most powerful antibiotic usually available. It should be put into the eye at least every 3 hours
- Encourage food rich in vitamin A and give vitamin A supplement
- Most cases of bacterial conjunctivitis are treated successfully with antibiotics and sulphonamides. Viral conjunctivitis usually lasts about two weeks; treatment may be necessary in cases that involve complications. Silver nitrate or antimicrobial ointments are applied to the eyes of newborn babies to prevent ophthalmia neonatorum.
- Environmental improvement: Modifications in water use, fly control, latrine use, health education and proximity to domesticated animals have all been proposed to reduce transmission of *C. trachomatis*. These changes pose numerous challenges for implementation. It seems likely that these environmental changes ultimately impact on the transmission of ocular infection by means of lack of facial cleanliness. Particular attention is required for environmental factors that limit clean faces.

## **Eye injuries/emergency care**

### Removal of loose foreign body from conjunctiva

- Foreign bodies like sand, dust may cause pain and lacrimation  
Care – Instruct the patient to look upwards  
Evert the lower lid to expose the conjunctiva sac  
Gently remove the particle with a cotton applicator dipped in sterile normal saline using a twisting motion. If particle is not found, examine the upper lid.  
Place the cotton applicator stick horizontally on outer surface of upper lid;  
grasp upper eye lashes with fingers of other hand and pull the upper lid outward and upward over the applicator stick.  
Gently remove the particles as above
- Penetrating injury to the eye – example darts, scissors, flying metals  
Care – Do not attempt to remove object  
Do not patient to apply pressure to the eye  
Cover eye lightly with sterile eye patch for embedded object e.g. metal  
Apply protective shield e.g. paper cup for impaled objects such as darts  
Cover injured eye to prevent excessive movement of injured eye.  
Refer immediately
- Chemical burns  
Care – Flush eye with copious amount of water for 15 to 20 minutes  
Have patient hold head under faucet to let water run over eye to thoroughly wash it out. You may need to forcibly separate eyelid during flush.  
If available, flush with syringe  
After flushing, refer

## 4.0 CONCLUSION

In this you have learnt about the disorders of the eye. The eye is the organ of vision or light sensitivity, usually occurring in pairs. It is the most important sense to most people.

The eye is an approximately spherical organ with light-sensitive rod and cone cells in the retina, which is responsible for converting light into impulses that are transmitted to the brain for interpretation.

Disorders could result from infections, injury, allergic reaction, nutritional deficiency or it could be age related and it may affect either the external or internal structures or both.

## 5.0 SUMMARY

In summary, you learnt that the eye is the organ of vision and has both external and internal structures. Eyelids and eye lashes, Conjunctiva and Lacrimal apparatus are some of the external structures, while the eyeball and lens are some of the internal structures

Some of the disorders include trachoma, glaucoma, cataract, stye and eye injuries that will require emergency management.

## 6.0 TUTOR MARKED ASSIGNMENT

Enumerate 4 common causes of blindness in the community.

How can it be prevented?



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## **MODULE IV**

## UNIT 15: HEALTH CONDITIONS OF THE NERVOUS SYSTEM

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  - 3.1 Overview of the anatomy and physiology of the nervous system
  - 3.2 Disorders of the brain
  - 3.3 Spinal cord disorders
  - 3.4 Simple faint, dizziness and convulsions (epilepsy)
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor Marked Assignment
- 7.0 References and further readings

### 1.0. INTRODUCTION

In this unit, health conditions of the nervous system will be discussed. It is the system that functions as the coordinated unit for the body, both structurally and functionally as it regulates systems, controls communication among body parts and coordinates activities of body system. When there is problem with this system, it will have an effect on many parts of the body.

There will be a brief review of the anatomy and physiology of the nervous system, followed by the discussion on the health conditions of the system

### 2.0. OBJECTIVES.

At the end of this unit, you should be able to:-

- Discuss the overview of the anatomy and physiology of the nervous system
- Describe the disorders of the brain
- Discuss the spinal cord disorder
- Explain simple faint, dizziness and convulsions (epilepsy)

### 3.0. MAIN CONTENT.

- 3.1 The Nervous system consists of the central nervous system (CNS) and the peripheral nervous system (PNS). The CNS includes the brain and spinal cord while the PNS includes the cranial and the spinal nerves as well as the autonomic Nervous system (ANS). The ANS is a subdivision of the PNS that automatically controls the body functions such as breathing and heartbeat. It is further divided into the sympathetic and parasympathetic nervous system.

Neuron – this is the functional unit of the nervous system. It is composed of Cell body (grey matter) axon and dendrites

Axon is the elongated process or fibre extending from cell body. It transmits impulses away from the cell to dendrites directly to the cell body of other neuron. Neuron usually has only one axon.

Dendrites are short branching fibre that receives impulses and conduct them toward the nerve cell body. Neuron may have many dendrites

Synapse refers to the junction between neuron where an impulse is transmitted

Neuron transmitters are chemical agents (e.g. acetylcholine norepinephrine) involved in the transmission of impulse across synapse.

Myelin sheath is a wrapping of myelin (a whitish fatty material) that protects and insulates nerve fibres and enhances the speed of impulse conduction.

Both axon and dendrites may or may not have a myelin sheath. So we can have (myelinated/unmyelinated). Most axon leaving the CNS is heavily myelinated by Schwann cells.

They are classified functionally thus

- afferent (sensory) neuron–transmit impulses from peripheral receptors to the CNS
- efferent (motor) neuron – conduct impulses from CNS to muscles and gland
- internuncial neuron (interneurons)-connecting links between afferent and efferent neuron.

The Central Nervous System consist of the brain and spinal cord

Brain – consist of cerebrum, diencephalon, brain stem and the cerebellum.

On the cerebrum, the grey matter is the outmost area while the deeper area is composed of white matter. It has two hemispheres and each hemisphere is divided into four lobes namely the frontal, parietal, temporal and occipital lobes.

Corpus callosum is the large fibre tract that connects the two cerebral hemispheres.

The diencephalon – is the connecting part of the brain between the cerebrum and the brainstem. The two most important structures out of all the structure contained in it are thalamus and hypothalamus.

Thalamus – relay station for discrimination of sensory signals (e.g. pain, temperature, touch).it also controls primitive emotional responses (e.g. rage, fear)

Hypothalamus – found immediately beneath the thalamus and plays a major role in regulation of vital functions such as blood pressure sleep, food and water intake and body temperature. It acts as control centre for the pituitary gland.

Brain stem – contains the mid brain, pons and medulla oblongata. It extends from the cerebral hemisphere to the foramen magnum at the base of the skull. It contains the nuclei of the cranial nerves and the long ascending and descending tract connecting the cerebrum and the spinal cord. It contains vital centres of respiration, vasomotor and cardiac functions.

Cerebellum – coordinates muscle tone and movement and maintains position in space.

Spinal Cord – serves as a connecting link between the brain and the periphery.

H shaped grey matter in the centre (cell bodies) surrounded by white matter (nerve tract and fibre)

Reflex Arc – Reflex consist of an involuntary response a stimulus occurring over a neural pathway called a reflex arc. It takes place at the cord level.

Components of a reflex arc

Sensory receptor receives/reacts to a stimulus

Afferent pathway transmits impulses to spinal cord.

Inter neuron – synapse with a motor neuron

Efferent pathway transmits impulses from motor neuron to effector.

Effector muscle or organ that responds to stimulus

## Supporting Structures

Skull is the rigid numerous bones fixed together. It protects, supports the brain.

Spinal column consists of 7 cervical, 12 thoracic and 5 lumbar vertebrae as well as sacrum and coccyx. It supports the head and protects the spinal cord.

Meninges - the membranes between the skull, brain, the vertebral column and spinal cord. It has 3 layers

- Dura mater – outmost layer, tough and leathery
- Arachnoid mater – middle layer web like.
- Pia mater – innermost layer, delicate clings to surface of brain.
- Area between arachnoid and Pia-mater is called sub arachnoid space.

Ventricles – Four fluid filled cavities connecting with one another and the spinal canal. It produces and circulates cerebrospinal fluid.

Cerebrospinal fluid (CSF) surrounds brain and spinal cord. It offers protection by functioning as a shock absorber. It allows fluid shifts from the cranial cavity to the spinal cavity. It carries nutrients to and waste products away from nerve cells.

### Peripheral Nervous System

31 pairs and carry impulses to and from spinal cord. Each segment of the spinal cord contains a pair of spinal nerves (one for each side of the body,) each nerve is attached to the spinal cord by two roots which are

- Dorsal (posterior) root – It contains afferent (sensory) nerves whose cell body is in the dorsal root ganglion.
- Ventral (anterior) root – It contains afferent (motor) nerves whose nerve fibres originate in the anterior horn cell of the spinal cord. (Lower motor neuron)

Cranial nerves 12 pairs and it carry impulses to and from brain. May have sensory, motor or mixed functions

Autonomic Nervous System (ANS) it is part of the peripheral nervous system. It includes those peripheral nerves (both cranial and spinal) that regulate functions occurring automatically in the body. ANS regulates smooth muscles, cardiac muscle and glands.

### Components

- Sympathetic nervous system generally accelerates some body functions in response to stress.
- Parasympathetic nervous system controls normal body functioning.

## 3.2 Health disorders of the brain

### Headache

This is diffuse pain in different parts of the head. There are different types

- Functional
- Tension (muscle contraction) this is associated with tension and anxiety.
- Migraine – recurrent throbbing headache often starts in adolescence, and affects women more than men. It is vascular in origin. There is vasoconstriction or spasm of cerebral blood vessels, (producing an aura) then vasodilatation.
- Cluster – similar to migraine (vascular origin.) recur several times a day over a period of weeks followed by remission lasting for weeks or months.
- Organic – This type of headache is secondary to intra cranial or systemic disease e.g. brain tumour

### Sign and symptoms

- Tension headache  
Pain usually bilateral often occurring in the back of the neck and extending diffusely over top of head.

- Migraine headache  
Severe, throbbing pain often in the temporal or supra orbit area, lasting several hours to days. There may be aura (e.g. visual disturbance) preceding the pain. Nausea and vomiting, pallor, sweating, irritability
- Cluster headache  
Intense throbbing pain usually affecting only one side of the face and head  
Abrupt onset lasts 30-90 minutes  
Eye and nose water on side of pain, skin reddens.

### **Brain tumour**

Tumour within the cranial cavity may be benign or malignant

There are 2 types

- Primary – originates in the brain tissues e.g. meningioma
- Secondary – metastasizes from tumour elsewhere in the body e.g. lung, breast

Sign and symptoms

- Headache – worse in the morning and with straining and stooping
- Vomiting
- Papilledema
- Seizures (focal or generalized)
- Changes in mental status
- Focal neurologic deficits e.g. aphasia, hemiparesis
- Sensory problems

Cerebrovascular accident (CVA)

In this condition, there is destruction (infarction) of brain cell caused by a reduction in cerebral blood flow and oxygen. Interruption of cerebral blood flow for 5 minutes or more causes death of neurons in affected areas with irreversible loss of function. It affects men more than women and incidence increases with age.

Causes include thrombosis, embolism, and haemorrhage

Risk factors include

- Hypertension, diabetes mellitus, arteriosclerosis/atherosclerosis, cardiac disease
- Life style - obesity, smoking, inactivity, stress, use of oral contraceptives.

Signs and symptoms

- Headache
  - Generalized signs such as vomiting, seizures, confusion, disorientation, decreased level of consciousness, fever, hypertension, slow bounding pulse, and Cheyne - Stokes respiration
- Focal signs will be related to the site of infection. There could be hemiplegia, sensory loss or aphasia

### **Head injury**

Usually caused by road traffic accident, falls, assaults

Types

- concussion – severe blow to the head jostles the brain causing it to strike the skull which results in temporary neural dysfunction
- contusion – result from more severe blow that bruises the brain and disrupts neural function
- Haemorrhage – there could be
- epidural hematoma - accumulation of blood between the dura mater and skull. Commonly result from laceration of middle meningeal artery during skull fracture. Blood accumulates rapidly

- subdural hematoma - accumulation of blood between the dura and arachnoid. It is venous bleeding that accumulates slowly. May be acute, sub-acute or chronic
- sub arachnoid hematoma - bleeding in sub arachnoids space
- Intracerebral hematoma – accumulation of blood within the cerebrum
- Fractures - it could be linear, depressed, communitied or compound

#### Signs and symptoms of the types of head injury

- for concussion there is headache, transient loss of consciousness, retrograde or post traumatic amnesia, nausea, dizziness, irritability
  - for contusion  
neurologic deficits depends on the site and extend of damage and it may include decreased level of consciousness, aphasia (i.e. partial or total inability to produce and understand speech as a result of brain damage caused by injury or disease), hemiplegia sensory deficits
- for haemorrhages
- Epidural hematoma – brief loss of consciousness followed by lucid interval, progresses to severe headache, vomiting, rapidly deteriorating level of consciousness, possible seizures, ipsilateral pupillary dilation
  - Subdural hematoma – alteration in level of consciousness, headache, focal neurologic deficits, personality change ipsilateral pupillary dilation
  - Interacerebral hematoma – Headache, decreased level of consciousness, ipsilateral papillary dilation
  - Fractures – headache, pain over fracture site. In compound fracture there will be rhinorrhea (leakage of CSF from the nose) otorrhoea (leakage of CSF from ear)

### 3.3 Spinal cord injuries

Occurs most commonly in young adult males between ages 15 and 25 years.

- Common traumatic causes are road traffic accidents, falls, diving in shallow water, industrial accidents, sport injuries, gunshot or stab wounds.
- Non traumatic causes include tumours, hematomas, aneurysms, congenital defect (e.g. spinal bifida)

It is classified by extent, level and mechanism of injury.

#### Signs and symptoms

Spinal shock occurs immediately after the injury as a result of insult to the CNS. It is a temporary condition lasting from several days to three months.

It is characterized by absence of reflexes below the level of lesion, flaccid paralysis, lack of temperature control in affected parts, hypotension with bradycardia, retention of urine and faeces.

Symptoms will depend on the level and the extent of the injury

#### Level of injury

- quadriplegia cervical injuries ( C1-C8) cause paralysis of all four extremities. Respiratory paralysis occurs in lesion above C6 due to lack of innervations to the diaphragm
- paraplegia thoraco/lumber injuries (T1-L4) cause paralysis of the lower half of the body involving both legs.

#### Extent of injury

- In complete cord transection there is loss of all voluntary movements and sensation below the level of the injury. Reflex activity below the level of the lesion may return after spinal shock resolves.

3.4 Other disorders of the nervous system  
Simple faint, dizziness and convulsions (epilepsy)

**Simple faint**

In a faint (or attack of syncope) the patient feels light headed, is not able to see properly, has muscle weakness cannot stand and loses full consciousness.

Most cases are caused by standing still for a long time during which blood stays in the legs and not enough goes back to the heart to go to the brain; anaemia, fear, worry, disgust and pain

If you lay the patient down, he will recover quickly in 1-3 minutes.

Rule out another condition especially a fit

**Dizziness (Vertigo)**

This is a condition in which somebody feels a sensation of whirling or tilting that causes a loss of balance. It may be associated with nausea and vomiting.

Causes includes

Disease of the brain

Some ear or eye conditions

**Convulsion (fit) and epilepsy**

Seizures – recurrent sudden change in consciousness, behaviour, sensation and/or muscles activities beyond voluntary control that are produced by excess neuronal discharge.

Epilepsy – refers to chronic recurrent seizures. Incidence is higher in those with family history of idiopathic seizures. Cause is unknown in 75% of epilepsy cases.

It is a disorder characterized by a disposition for seizures.

4.0. CONCLUSION

In the unit we examined the nervous system consisting of the central nervous system and the peripheral nervous system.

It is the network of nerve cells and nerve fibres that convey sensation to the brain and motor impulses to organs and muscles.

It is the control centre for all the organs and the system in the body. Therefore disorders of this system will affect many other parts of the body. The disorders discussed in this unit are those that occur as a result of accidents or malfunctioning of the system. In this next unit we will discuss disorders due to infections.

5.0 SUMMARY

In summary, the nervous system consists of central nervous and peripheral nervous system. The brain and the spinal cord make up the central nervous system (CNS) while the cranial and spinal nerves as well as the autonomic nervous system make up the peripheral nervous system (PNS). Within the CNS are very important structures like the thalamus and the hypothalamus.

Any alteration in the normal functioning of the CNS and PNS will result in the disorders of the nervous system.



## 6.0. TUTOR MARKED ASSIGNMENT

Enumerate the differences between cerebro vascular accident (CVA) and spinal cord injury.

## 7.0 REFERENCE AND FURTHER READING

- Beneson. (1995) Control of communicable diseases Manual. London : Macmillan
- Cook, G. C. (1996) Manson's Tropical diseases London: Saunders
- FMOH. (1995) CHO & CHEW Standing Orders (4th ed.) Lagos.
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## UNIT 16: HEALTH CONDITIONS OF THE NERVOUS SYSTEM THAT OCCUR DUE TO INFECTION

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  - 3.4 Management approach of patients with disorders of the nervous system
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### 1.0 INTRODUCTION

In the last unit we began the discussion on health conditions of the Nervous system with disorders that are not due to infection. In this unit, we will discuss the disorders that are due to infections.

The history to be obtained and examination to perform as well as the management will be discussed.

### 2.0 OBJECTIVES

At the end of this unit you should be able to

- Describe the health conditions of the nervous system that are due to infection.
- Highlight the history that should be obtained for disorders of nervous system.
- Enumerate the examination to perform to arrive at the findings to guide in managing the patients.
- Discuss the general approach to management of patients with disorders of the nervous system.

### 3.0 MAIN CONTENT

#### 3.1 **Meningitis**

Inflammation of the meninges of the brain and spinal cord. It may be caused by bacteria, viruses, or other microorganisms. The most common organisms causing it are meningococcus, pneumococcus, haemophilus influenza and streptococcus.

Meningitis is usually a disease of children, but anyone can be infected by droplets from patients or carriers.

The organism may reach the Central Nervous System (CNS) through the blood, cerebrospinal fluid or lymph; by direct extension from adjacent cranial structures (nasal sinuses, mastoid bones, ear, and skull fracture) or by oral or nasopharyngeal route.

The infection causes acute inflammation with pus in the meninges, damage to the brain and toxæmia or septicaemia

Sign and symptoms

- Headache
- Photophobia (sensitivity to light)
- Pain in the back and other parts of the body
- Nausea and vomiting
- Fever and chills
- Irritability, restlessness

Signs of meningeal irritation which include full or bulging fontanelle (in infants only), Stiff neck

Positive Kernig's sign – contraction or pain in the ham string muscle when attempting to extend the leg when the hip is flexed.

Opisthotonos – head and heel bent backward and body arched forward.

Brudzinski's sign – flexion at the hip and knee in response to forward flexion of the neck

General signs of infection are usually present i.e. fever, fast pulse, fast respiration, dehydration

Possible seizure and decreasing level of consciousness

### **Encephalitis**

Inflammation of brain caused by virus e.g. herpes simplex (type I) or arbovirus (transmitted by mosquito or tick).

It may occur as a sequel of other diseases such as measles, mumps chicken pox

Signs and Symptoms

- Headache
- Fever, chills, vomiting
- Sign of meningeal irritation as stated under meningitis
- Possibly seizures
- Alterations in level of consciousness

### **Brain Abscess**

Collection of free or encapsulated pus within the brain tissue. Usually follows an infectious process elsewhere in the body (ear, sinuses, mastoid bone)

Signs and Symptoms

- Headache, anorexia, malaise, vomiting
- Sign of increased intracranial pressure
- focal neurologic deficits (hemiparesis, seizures)

### **Cerebral malaria**

It is an acute damage of the brain and meninges caused by falciparum malaria parasites and their toxins in the blood vessels of the brain.

It is characterized by

Unrousable coma that cannot be attributed to another cause

Generalized convulsions

Severe normocytic anaemia

Hypoglycaemia  
Metabolic acidosis with respiratory distress  
Fluid and electrolyte disturbances  
Acute renal failure  
Acute pulmonary oedema and acute adult respiratory syndrome  
Circulatory collapse, shock, septicaemia  
Abnormal bleeding (bruising, bleeding gums)  
Jaundice  
Haemoglobinuria secondary to haemolysis  
High fever  
Hyperparasitaemia

These severe manifestations can occur singly or more commonly in combination in the same patient.

### **Tetanus**

This is acute disease of the nervous system caused by tetanus toxin, which is made when tetanus bacteria grow in the body.

Tetanus bacteria (*Clostridium tetani*) normally live in the intestine of animals and in dirt. They can get into a person's body when dirt gets into the body e.g. through wounds or burns, the female genital tract during delivery and the cut end of a baby's umbilical cord at birth.

The bacteria exotoxins affect motor nervous causing rigidity and spastic muscles.

#### Signs and Symptoms

The first symptoms are usually pain and stiffness of the jaw (trismus) difficulty in opening the mouth wide and difficulty in swallowing. The pain and stiffness then spread to the whole body. Several days later, spasms of the whole body usually occur. The spasms last for a few to severe seconds. Movement of the patient's body or a sudden noise can sometimes trigger the spasms. During the spasms, the patient is conscious and in great pain.

### **Poliomyelitis**

Poliomyelitis is an acute inflammation of parts of the brain and spinal cord by one of the polio viruses, which are spread by faecal-oral route or less often by respiratory secretions. The virus multiplies in the GI tract, and enters the blood stream to affect the CNS. It results in paralysis in less than 2% of the infected.

#### Signs and Symptoms

Polio illness is usually mild. The patient may have a sore throat, fever, headache and feel nauseated. Also the patient may have a nonspecific viral gastroenteritis or febrile illness. This can cause sudden paralysis of group of muscles in one or two days. Other groups may be paralyzed in the next week or so. Often a number of limbs are partly paralyzed. There is often severe pain and aching in the affected muscles, but there is no loss of sensation. If the respiratory muscles are affected, there may be death because the patient will not be able to breathe.

### **Rabies**

This is an acute viral disease of the brain and the salivary glands of animals e.g. dog, but can be transmitted to men when he is bitten by a dog infected with rabies.

#### Signs and Symptoms in man include:

There is history of an animal bite usually a dog which was behaving abnormally.

The disease has long incubation period before the first sign appear.

The patient becomes 'sick' for a few days with fever, headache etc.

The patient then has a period of encephalitis which produces over-activity or paralysis or a mixture of both. Some becomes very anxious and sudden onset of light

or noises cause strange behaviour. There are episodes of wild behaviour, muscles spasms and fear.

Patient cannot swallow because of spasms of the throat muscles. Site of water causes these spasms.

Patient dies usually within 10 days but it can be shorter or longer.

3.2 History – the detailed history will be obtained as follows

Presenting Problem for which symptoms may include –

History of head injury, behaviour changes, memory loss, and mood changes; Seizures, syncope, vertigo

When did the problem start? Was there loss of consciousness or irritability?

Ask if the patient can remember what happened

Any nervousness or anxiety, mood changes

Ask if there is any motor problem (paralysis, tremor)

Ask if there is any sensory problem (pain, paresthesias)

Ask if there is headache; fever of a sudden onset, pain and stiffness of jaw, nausea or vomiting

Ask about the life style – drug and alcohol intake, exposure to toxins, recent travels, employment stressors

Use of medications – prescribed and over the counter

Past medical history – perineal exposure to toxic agents, x-rays, difficult labour and delivery

History of childhood and adulthood – history of systemic diseases, seizures, loss of consciousness, head injury

Immunization history

Family history – may uncover diseases with hereditary or congenital background.

3.3 Detailed examination includes:

Mental status examination

General appearance and behaviour

Asses level of consciousness

Asses intellectual function – memory (recent and remote) attention span, cognitive skills.

Asses emotional status, thought content

Asses language/speech - expressive aphasia – inability to speak

Examine for receptive aphasia – inability to understand spoken word

Check if there is dysarthria – difficult speech due to impairment of muscles involved with production of speech

Asses Cerebella function – posture, gait, balance, co-ordination

Asses Motor function – muscle size, tone strength, abnormal or involuntary movements and movement of extremities (paralysis)

Asses Sensory function – light touch, superficial pain, temperature, vibration and position sense.

Reflexes – check for normal reflexes and pathologic reflexes e.g. Babinski reflex (dorsiflexion of great toe with fanning of other toe) Kernig's signs, trismus.

Neurologic examination will include

Orientation to time place and person

Ability to follow commands

If patient does not respond to verbal stimuli, apply painful stimulus e.g. pressure on nail bed. Note response to pain.

Abnormal posturing

Papillary reaction and eye movements

Vital Signs –

Note respiratory patterns

- Cheyne – strokes – regular rhythmic alternating between hyperventilation and apnoea.
- Central neurogenic hyperventilation – sustained rapid regular respirations with normal blood oxygen levels.
- Apneustic breathing – prolonged inspiration phase, followed by a 2 to 3 seconds pause.
- Cluster breathing – cluster irregular breathing followed by periods of apnoea
- Ataxic breathing – breathing pattern completely irregular.

Auscultate breath sounds for crackles, (rales) rhonchi or absent breath sounds.

Blood pressure, pulse rate, temperature.

Patient may require any of the following to confirm the diagnosis. Patient will have to be referred to a higher level to carry out these tests.

- Lumbar puncture
- X-rays of skull and spine
- Computerized tomography (CT scan)
- Magnetic resonance Imaging (MRI)
- Brain scan
- Electroencephalography (EEG)

### 3.4 Management of Common signs and Symptoms

Most of the patient presenting with disorders of the nervous system will be referred. However, there are some immediate cares that can be done at the Primary health care level before referring the patient and they are as follows:

Routine care for unconsciousness

Maintain a clear patent airway.

Lay patient on the side (never on his back)

If tongue is obstructing, insert oral airway suction as needed.

Take vital signs and perform neuro checks at regular intervals (every 1 – 2 hours).

Provide for client safety – avoid restrains if at all possible.

Observe client carefully for seizures and intervene to avoid precipitating factors.

Protect client if seizure occurs.

Headache

Migraine attack is treated with cafergot (ergotamine with caffeine) and for the prevention propranolol (Inderal) can be used.

Other attack of headache is treated symptomatically with

Non-narcotic – analgesics e.g. aspirin, acetaminophen

Analgesic – sedative/tranquilizer combination.

Rabies

Give proper treatment for the bite

Wash wound with a lot of soap and water

Rinse with a lot of water.

Then apply iodine in spirit

Do the necessary surgical toilet, do not stitch the wound.

Dress and apply a compression bandage to stop bleeding.

Give tetanus prophylaxis

Try to find out if the animal has rabies and refer patient for immunization if necessary.

If the animal looks healthy, lock it up for 10 days. If it is still alive and well after 10 days the animal did not have rabies and no immunization of the patient is necessary.

Start passive immunization with anti-rabies hyper immune serum if the

- animal has disappeared
- animal has been killed
- animal has been caught and looks sick

### Poliomyelitis

Polio is a disease under surveillance by WHO

Polio is viral infection; no treatment is available for the cure. However, the main way of control is by raising the resistance of the people to polio through immunization. Oral Polio Vaccine, (OPV) is given at birth, and then 6 weeks, 10 weeks and 14 weeks of age.

### Tetanus

The patient is referred but the management before transfer is as follows:

Give 1/M chlorpromazine 100mg stat.

Give 1/M phenobarbitone 100 – 200mg or 1/M paraldehyde 10ml stat.

Set up intravenous infusion.

Give I/V diazepam 10mg slowly when necessary to control the spasms.

Give 1/M human tetanus immunoglobulin 500 units stat.

Give benzyl penicillin 2000000 units (1.2g) stat 1/M and continue 6 hourly.

Give nothing orally.

Make sure the patient lie on his side with the head lower than the feet. Maintain a clear airway.

The patient must be accompanied to the referral centre by the health worker.

### Management of patient with convulsion (fits) or epilepsy

Check to make sure the patient does not hurt himself during fits.

When unconscious give care as for unconscious patient.

Stop the fit with anticonvulsant drugs. Give 1/M paraldehyde. If not successful give 1/V diazepam.

Find and treat the cause.

Give phenobarbitone or phenytoin when the patient can swallow.

Phenobarbitone 90mg twice daily or phenytoin 300mg daily or more if fits are not controlled or less if there is side effects especially dizziness unsteadiness on the feet, swelling of gum, anaemia rashes, enlarged lymph nodes or encephalitis

### Cerebral malaria

In all cases of suspected severe malaria, parenteral, anti-malarial chemotherapy must be started immediately if the cause of coma is in doubt, also test for (and treat) other locally prevalent causes of coma e.g. bacterial, fungal or viral meningoencephalitis.

Give Quinine Dihydrochloride 1/V Loading dose – 20mg salt/kg omit the loading dose if the patient has had adequate dose of quinine (>40mg salt/kg) in the previous 2 days. Recent treatment with mefloquine is not a contraindication to a loading dose of quinine.

The loading dose is given as an 1/V infusion over 4 hours. It can be diluted in 5% dextrose, 10% dextrose, 4% dextrose in 0.18% saline or normal (0.9%) saline.

Dilute quinine to a total volume of 10ml/kg and infuse over 4 hours.

Maintenance dose 10mg salt/kg which must be given every 8 hours The maintenance dose should be given as an infusion over 4 hours.

If 1/V therapy is still required after 48 hours, the maintenance dose should be reduced to 7mg salt/kg to avoid risk of accumulation.

A minimum of 3 doses of 1/V quinine should be given before changing to oral treatment.

Once the patient is able to tolerate oral medication treatment should be completed with (1)

SP + 3 days of artesunate.      OR

(2) Full course coartem (3 days)      OR

(3) Oral quinine 10mg salt/kg every 8 hours to complete the remainder of a total of 7 days of quinine treatment.

#### 4.0 CONCLUSION

In this unit, some of the health conditions of the Nervous System that are acquired through infection were discussed to include meningitis, encephalitis cerebral malaria, Poliomyelitis Tetanus and Rabies.

The history to obtain and examination that can be performed to enable us ascertain the exact problems were highlighted.

The management of some of the conditions was discussed.

#### 5.0 SUMMARY

The common infections affecting the nervous system can be caused by bacteria, fungal or viral. The common symptoms include unconsciousness, convulsion/seizures/fits, headache and paralysis.

The management will depend on the cause, the presentation and the condition of the patient.

#### 6.0 TUTOR MARKED ASSIGNMENT

How will you determine a patient is suffering from encephalitis, epilepsy or cerebral malaria?

#### 7.0 REFERENCE AND FURTHER READING

- Beneson. (1995) Control of communicable diseases Manual. London : Macmillan
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## UNIT 17: REFERRAL SYSTEM (INTRODUCTION)

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### 1.0 INTRODUCTION

This unit will examine referral system in primary health care. One of the basic assumptions of the standing orders is that hospital referral facilities will be available and incorporated in the plan for National network of health facilities. This one of the strategies that will make treatment more accessible to members of the population, so that there is no gap, but is operated as a continuum

### 2.0 OBJECTIVES

By the end of this unit, you should be able to: -

- Discuss the referral system
- Describe the component of referral system
- Discuss the levels of referral in Nigerian health system
- Illustrate the 2-way referral system with a diagram

### 3.0 MAIN CONTENT

- 3.1 A referral can be defined as a process in which a health worker at one level of the health system, having insufficient resources (drugs, equipment, skills) to manage a clinical condition, seeks the assistance of a better or differently resourced facility at the same or higher level to assist in, or take over the management of, the client's case.

A 2-way referral system in PHC is a system where cases that cannot be managed effectively at a particular level are referred to a higher level of health care. Similarly cases that have been treated successfully at the higher levels are referred back to the lower levels for follow up.

It is a process by which a health worker transfers the responsibility of care temporarily or permanently to another health professional or social worker or to the community

Key reasons for deciding to refer either an emergency or routine case include:

- to seek expert opinion regarding the client
- to seek additional or different services for the client
- to seek admission and management of the client
- to seek use of diagnostic and therapeutic tools
- when illness is not covered by the standing orders
- illness is not responding to treatment within the specified time in the standing orders

An effective referral system ensures a close relationship between all levels of the health system and helps to ensure people receive the best possible care closest to home. It also assists in making cost-effective use of hospitals and primary health care services. Support to health centres and outreach services by experienced staff from the hospital helps build capacity and enhance access to better quality care. In many developing countries, a high proportion of clients seen at the outpatient clinics at secondary facilities could be appropriately looked after at primary health care centres at lower overall cost to the client and the health system. A good referral system can help to ensure:

- Clients receive optimal care at the appropriate level and not unnecessarily costly
- Hospital facilities are used optimally and cost-effectively
- Clients who need specialist services most can access them in a timely way
- Primary health services are well utilized and their reputation is enhanced

The three levels of health care delivery in Nigeria should enjoy patronage from clients and a good referral system is the main link between these levels. The primary health centres are supposed to be the point of first contact of patients. Patients are then referred from here to other levels of health care.

3.2 Being a system, it composed of many parts. Examination of a referral system requires consideration of all its parts.

Important components of a referral system are listed as follows

- Health System
  - Service providers (public and private sector) and quality of care
    - Strengthened primary health care services
    - Clarity of level and role of each facility
    - Availability of protocols of care for conditions for each level of facility
    - Availability of communication and transport
  - Performance expectations
    - Expectation to refer appropriately and follow protocols of care
    - Expectations that health workers and clients adhere to the referral discipline

Regular supervision and capacity building

- Involvement of organizations
  - Ministry of Health
  - Local Government Area
  - Non-Governmental Organizations
- Initiating facility
  - The client and their condition
  - Protocol of care for that condition at that level of service
  - Treat and stabilize client as stated in the standing order
  - Decision to refer
- Referral practicalities
  - Outward referral form
  - Communication with receiving facility (make arrangements as appropriate)
  - Information to the client and their family/support network
    - Reasons and importance of referral, risks of non-referral
    - How to get to the receiving facility – location and transport
    - Who to see and what is likely to happen
    - Follow-up on return
  - Empathy - understanding of implications for client and family/support network
  - Overall fear
    - Cost of transport, treatment and family accommodation
  - Referral registers to monitor follow-up and gather statistics
- Receiving Facility
  - Anticipate arrival and receive client and referral form
  - Provide care – document treatment provided
  - Plan rehabilitation or follow-up with client and family/support network
  - Back referral form
  - Feedback to initiating facility on appropriateness of referral
  - Referral registers to monitor follow-up and gather statistics
- Supervision and capacity building
  - Monitor outward and back referrals
  - Number and appropriateness of referrals – compliance with protocols
  - Quality of documentation
  - Consistency of follow-up
  - Provide feedback, support and training for health staff
  - Provide feedback to central level

3.3 In Nigeria there is a three-tier system of health care, namely: Primary Health Care, Secondary Health Care, and Tertiary Health Care, and a good referral system is the main link between them.

### Primary Health Care

The Provision of health care at this level is largely the responsibility of Local Governments with the support of state ministries of health and within the overall national health policy. Private medical practitioners also provide health care at this level.

### Secondary Health Care

This level of health care provides specialized services to patients referred from the primary health care level through out-patient and in-patient services of hospitals for general medical, surgical, paediatric patients and community health services. Secondary health care is available at the district, divisional and zonal levels of the states. Adequate supportive services such as laboratory, diagnostic, blood bank, rehabilitation and physiotherapy are also provided.

### Tertiary Health Care

This level consists of highly specialized services provided by teaching hospitals and other specialist hospitals which provide care for specific diseases such as orthopaedic, eye, psychiatric, maternity and paediatric cases. Care is taken to ensure an even distribution of these hospitals. Also, appropriate support services are incorporated into the development of these tertiary facilities to provide effective referral services. Similarly, selected centres are encouraged to develop special expertise in advantage modern technology to serve as a resource for evaluating and adapting these new developments in the context of local needs and opportunities.

The primary health facilities are supposed to be the point of first contact of patients because they are the closest to where people live and work. Patients are then referred from here to other levels of health care.

## 3.4 The 2-way referral system

In the 2-way referral system, there is the normal route and emergency route.

Normal route is path is as follows: -

When the health posts/VHWs/TBAs/Outreach clinics have conditions that cannot be managed, the patient is sent to the first referral facility (health clinics).

If at that level the condition cannot be managed, the patient is sent to the district referral facility (primary health centres)

If at that level the condition can still not be managed, the next place of referral is the comprehensive health which is the highest referral facility at the primary level.

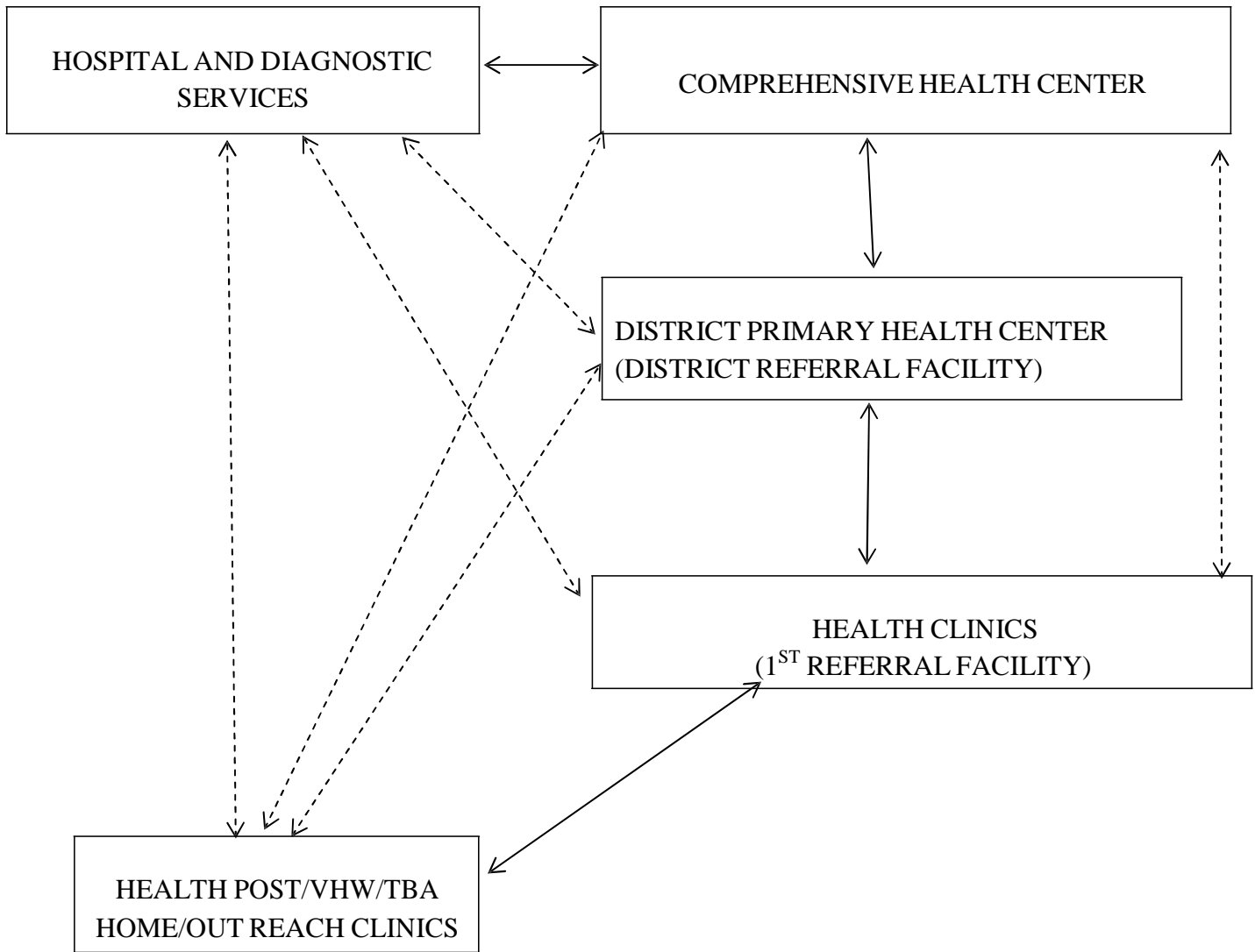
A condition that cannot be managed at that level is referred to the secondary level of health care.

### Emergency route

In cases of emergency, one or more referral levels are by passed in order to the patient to a health facility where he/she will receive the needed attention. e.g. a case of intrapartum haemorrhage in a health clinic will be referred to a comprehensive health centre where she can get blood transfusion rather than a primary health centre where there is no facility for blood transfusion.

Diagrammatic illustration of the 2-way referral system

2-WAY REFERRAL SYSTEM



←————→ NORMAL PATH  
←-----→ EMERGENCY PATH

#### 4.0 CONCLUSION

The primary health centres are supposed to be the point of first contact of patients. Patients are then referred from here to other levels of health care. Referral system is a process by which a health worker transfers the responsibility of care temporarily or permanently to another health professional or social worker or to the community and being a system, it

is composed of many parts which include health system, Initiating facility, referral practicalities, receiving facility, supervision and capacity building

It is a 2-way system where cases that cannot be managed effectively at a particular level are referred to a higher level of health care. Similarly cases that have been treated successfully at the higher levels are referred back to the lower levels for follow up.

#### 5.0 SUMMARY

This unit discussed the referral system as a process in which a health worker at one level of the health system, having insufficient resources (drugs, equipment, skills) to manage a clinical condition, seeks the assistance of a better or differently resourced facility at the same or higher level to assist in, or take over the management of, the client's case

There are three levels of health care delivery in Nigeria and a good referral system is the main link between these levels.

In the 2-way referral system, there is the normal route and emergency route and the pathway is illustrated in the diagram above.

#### 6.0 TUTOR MARKED ASSIGNMENT

What is the state of referral services in the Nigerian health system?

#### 7.0 REFERENCE AND FURTHER READING

Akande T. M. (2004) Referral system in Nigeria: study of a tertiary Health facility  
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## UNIT 18: COMPONENTS OF THE REFERRAL SYSTEM I

### TABLE OF CONTENTS

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
  - 3.1 Health system issues
  - 3.2 Initiating facility
  - 3.3 Referral practicalities
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor Marked Assignment
- 7.0 References and further readings

### 1.0 INTRODUCTION

In this unit we will begin the discussion on the components of the referral system for you to have a better understanding. Health system issues, Initiating facility and Referral practicalities will be discussed in this unit

### 2.0 OBJECTIVES

By the end of this unit, you should be able to:

- Discuss the health issues component of the referral system
- Describe the responsibilities of the initiating facility
- Discuss the practicalities of referral system

### 3.0 MAIN CONTENT

#### 3.1 Health system issues

Service providers (public and private) and quality of care

For a referral system to work at its best relationships between service providers are formalized and referral procedures agreed. All levels of the health system, including primary health care services, need to be functioning appropriately. This includes each facility:

- being clear about their role, responsibilities and limitations
- having readily available protocols of care for conditions for that level of service
- having suitable means of communication and transport.

Communication is generally by the referral form but may in addition be by radio, phone or fax. Where government is unable to provide an ambulance for health

centres, a community-based system of organizing transport may sometimes be possible.

Clients' bypassing lower level services is a common problem which leads to overcrowding of higher level facilities. Improvement in resource availability and quality of care at the lower levels is the first priority – it is essential to strengthen primary health care services to make them attractive and credible in the eyes of clients.

In overcrowded hospital outpatient departments, queuing systems can be designed to separate and fast-track referred clients, while explaining to those who bypass their primary services why they have to wait longer (but emergencies and very serious cases should always be seen promptly). In addition, penalty fees charged to those who arrive at higher level facilities without a referral letter or other clear indication of necessity may also help to curb unnecessary use of these expensive facilities. In urban areas, having primary and secondary services in separate (but proximate) locations enables rigorous enforcement of the referral only policy at the secondary facilities.

Intensive public communication and education is essential to inform the public how, where and when they should seek health care at different levels and to build their confidence that lower level facilities really can offer acceptable quality care when they need it.

#### Performance expectations and involvement of organizations

A referral system will function effectively if all service providers are expected to adhere to the referral discipline, to refer appropriately, and to follow the agreed protocols of care (where this system applies). It is the role of the supervising organization and facility supervisors to monitor referral statistics and to provide feedback as appropriate. The national health authorities (e.g. Ministry of Health) must expect the supervisors to regularly take action to ensure that the referral system progressively improves.

To achieve this level of consistent professional performance also requires appropriate education at health training institutions and involvement of professional associations in setting standards for the referral processes.

### 3.2 Initiating facility

The facility that starts the referral process is called the initiating facility and they prepare an outward referral to communicate the client condition and status (see sample tool 1).

When a client visits the health Centre, it is important that the health worker attends to them promptly, treats them with respect, privacy and confidentiality, acknowledging their cultural beliefs, and identify their needs.

The health workers need to have ready access to, and be very familiar with, the agreed national protocols for that level of facility, that is, the standing orders. Protocols need to include likely circumstances for referral and details of the information and documents that should be sent with the client.



The health workers assess the client, gather relevant information and provide any necessary care possible at that facility. In an emergency situation, the health worker must maintain all vital functions and minimize any further damage.

Making the decision to refer the client comes after the health worker has gathered and analyzed the relevant information using the protocol of care as a guide. Deciding to refer does not mean that the health worker is inadequate or bad.

### 3.3 Referral practicalities

A referral form that is standardized throughout the network of service providers ensures that the same essential information is provided whenever a referral is initiated. The referral form is designed to facilitate communication in both directions - the initiating facility completes the top part or the outward referral. Every patient referred out should be accompanied by a written record of the clinical findings, any treatment given before referral and specific reasons for making the referral. The referral form should accompany the client (often carried by them) and give a clear designation of to which facility the patient is being sent. A carefully filled referral form help the client get timely attention at the receiving facility.

In some situations it will be possible and necessary to communicate with the receiving facility to make an appointment or other arrangements for the referral, or to let them know of the pending arrival of an emergency case. If the client is very ill, it might be necessary for a health worker to accompany them to the receiving facility.

The decision to refer might be frightening or distressing for the client and their family so it is important that the health workers have empathy and give the client relevant information such as:

Reasons and importance of the referral, risks associated with not going

How to get to the receiving facility – location and transport

Who to see and what is likely to happen

The process of follow-up on their return

Health workers can show empathy in understanding the implications of referral for the client and their family or support network. The client may be:

frightened of the unknown, frightened of becoming more ill or even dying

concerned about meeting the costs of transport, treatment and family accommodation

concerned about leaving work that needs to be done

Each facility in the network should have a referral register to keep track of all the referrals made and received. Information from the register is used to monitor referral patterns and trends. A standardized referral register used throughout the network of service providers can facilitate this

#### 4.0 CONCLUSION

In this unit, we discussed some of the components of referral system. Under the health system issues we stated that relationships between service providers are formalized and referral procedures agreed for the system to function at its best. The facility that starts the referral process is called the initiating facility and they prepare an outward referral to communicate the client condition and status. A referral form that is standardized throughout the network of service providers ensures that the same essential information is provided whenever a referral is initiated samples of the referral forms are provided below.

#### 5.0 SUMMARY

In summary, the components include the health system issues, which talks about service providers and quality of care, as well as performance expectations; the initiating facility which is the facility that is referring and it must be based on standard treatment protocol; the use of a standardized form in all network of service providers.

#### 6.0 TUTOR MARKED ASSIGNMENT

Design a form that could be used to refer a patient

#### 7.0 REFERENCE AND FURTHER READING

Akande T. M. (2004) Referral system in Nigeria: study of a tertiary Health facility  
Annals of African Medicine Vol. 3, No. 3

Federal Ministry of Health (FMOH). National health policy

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<http://www.motherlandnigeria.com/health.html#Links>  
kidsinmindsupport@mater.org.au

Ransome-Kuti O., Sorungbe A.O.O., Oyegbite K.S. et al (1998). Strengthening primary health care at the local Government level. The Nigerian experience. Academy Press, Lagos.

WHO (2010) Referral systems WHO Website Management of health facilities:  
WHO <http://www.who.int/management/facility/referral/en/index.html>

WHO (1997) Tropical diseases Research Progress 1995-1996. Geneva: WHO

Below are samples of referral forms

The facility that starts the referral process is called the initiating facility, and they prepare an outward referral to communicate the client condition and status (see sample tool 1).

The facility that accepts the referred case is called the receiving facility and at the end of their involvement, they prepare a back referral on the lower part of the forms to let the initiating facility know what has been done (see sample tool 1). This completes the referral loop between the 2 facilities.

A referral register is a means of maintaining a list of all outward and inward referrals for one facility or service provider (see sample tool 2). Information registered includes client referred, to where, when and why, whether the case is closed or continuing (the returning referral form has been received with any necessary rehabilitation or follow-up), and whether it was an appropriate referral or if there were any issues.

Sample tool 1

Name of facility:		Referral Form			original / copy	
Referred by:	Name:		Position:			
Initiating Facility Name and Address:				Date of referral:		
Telephone arrangements made:	YES	NO	Facility Tel No.	Fax No.		
Referred to Facility Name and Address:						
Client Name						
Identity Number				Age:	Sex: M F	
Client address						
Clinical history						
Findings						
Treatment given						
Reason for referral						
Documents accompanying referral						
Print name, sign & date	Name:		Signature:		Date:	
Note to receiving facility: On completion of client management please fill in and detach the referral back slip below and send with patient or send by fax or mail.						

-----?<-----receiving facility - tear off when making **back referral**-----  
 --?<--

Back referral from Facility Name		Tel No.	Fax No.		
Reply from  (person completing form)	Name:			Date:	
	Position:		Specialty:		
To Initiating Facility: (enter name and address)					
Client Name					
Identity Number			Age:	Sex:	M   F
Client address					
This client was seen by: (give name and specialty)				on date:	
Patient history					
Special investigations and findings					
Diagnosis					
Treatment / operation					
Medication prescribed					
Please continue with: (meds, Rx, follow-up, care)					
Refer back to:				on date:	
Print name, sign & date	Name:		Signature:		Date:

Prepare one copy to send with the client, and keep one copy in the client notes.





## UNIT 19: COMPONENTS OF THE REFERRAL SYSTEM II

### TABLE OF CONTENTS

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
  - 3.1 Receiving health facility
  - 3.2 Supervision and capacity building
  - 3.3 Continuous quality improvement
  - 3.4 Illustrate the referral system flow with a diagram
  - 3.5 Guideline for setting up referral system
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor Marked Assignment
- 7.0 References and further readings

### 1.0 INTRODUCTION

In this unit we will conclude the discussion on the components of the referral system. The remaining components are receiving Facility, Supervision and capacity building and Continuous quality improvement

### 2.0 OBJECTIVES

By the end of this unit, you should be able to:

- Discuss the receiving facility of the referral system
- Explain supervision and capacity building in referral system
- Discuss the continuous quality improvement in referral system
- Illustrate the referral system flow with a diagram
- Explain guideline for setting up referral system

### 3.0 MAIN CONTENT

#### 3.1 Receiving Facility

The facility that accepts the referred case is called the receiving facility and at the end of their involvement, they prepare a back referral on the lower part of the forms to let the initiating facility know what has been done (see sample tool 1 of the previous unit). This completes the referral loop between the 2 facilities

If forewarned, the receiving facility can anticipate the arrival and receive the client with their referral form. They will use the information sent on the referral form to begin a thorough assessment of the client and begin management of the case.

The receiving facility will use its particular resources to provide the client high quality care and maintain documentation according to agreed standards.

As the care progresses, the receiving facility will plan the rehabilitation or follow-up programme with client and their family or support network.

When the client's care has finished at the higher level facility, back referral/feedback to the original facility is important. The receiving facility completes the lower part of the referral form (see sample tool 1). This communication contains information on special investigations, findings, diagnosis and treatment given by the higher level facility as well as follow up expected from the lower level facility. The back referral/feedback can be delivered by the client to the initiating facility, but may also be sent by fax or post. This communication not only assures proper patient care and follow up, but also provides continuing education to the initiating facility and their staff. The supervisor should check that back referral/feedback is received and, in its absence, pursue the relevant staff at the higher level facility to provide proper back referral/feedback information.

- a. The receiving facility can also give feedback to the initiating facility on the appropriateness of referral. If there are any issues regarding the need for referral, timing, speed or information sent, then it is important that the higher level facility provides specific feedback to the initiating facility. This will assist the lower level facility to be surer of referral processes in the future.
- b. The receiving facility completes its own register of referrals in and out, from their perspective (see sample tool 2)

### 3.2 Supervision and capacity building

Facility managers and supervisors at all levels should monitor all referrals made to and from facilities in their area each month. Usually between 5% and 10% of clients seen in a primary health care facility will be referred to a higher level for diagnostic services or more specialized care. Supervisors should discuss referred cases:

- Identify those which should have been properly treated at the facility itself without referral
- Identify cases which should have been referred but were handled locally
- Check the back referrals/feedback received to determine whether the information is adequate and being acted upon by the facility
- Follow up cases that have been referred but no feedback yet received to assure that the client has arrived at the higher level
- Identify any issues regarding timing, promptness and completeness of information sent

Results of this analysis can be covered at meetings with hospital and clinic staff together. As the issues are discussed, staff will identify what is needed to improve



things - this might include clinical training or strengthening of particular parts of the referral system or its procedures. Facility managers and supervisors need to ensure that such items are followed-up and acted on. In-service education and capacity strengthening can be reinforced by good supervision.

Long-term treatment of chronic illnesses such as diabetes, hypertension, epilepsy and psychiatric illness can be managed at suitably resourced health centres - this assures not only high quality of care for the client, but also greater convenience and less burden on the client and the higher levels of the health system.

Effective referral requires clear communication to assure that the patient receives optimal care at each level of the system. Because the patient is moving between facilities it is the role of the supervisor to assure that this movement is facilitated and that proper communication accompanies it in both directions: upward, describing the problem as seen at the lower level facility and requesting specific help and, importantly, information back to the lower level facility describing the findings, the actions to be taken and the follow up needed.

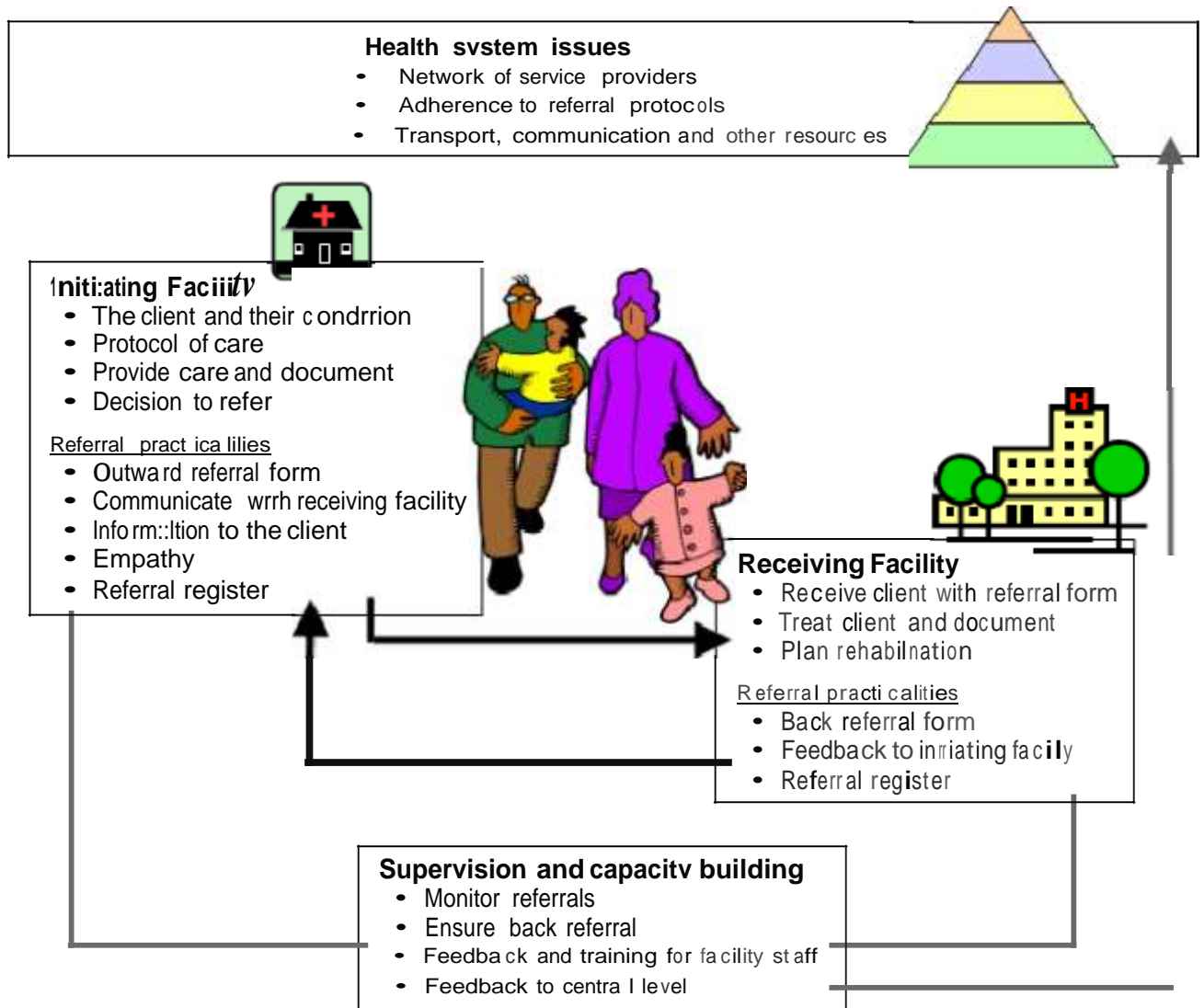
The weakest part of this communication is generally back referral/feedback from the higher level facility. This communication not only assures proper patient care and follow up, but importantly provides continuing education to the lower level facility and their staff. The supervisor should assure that such communication occurs and in its absence actually pursue the medical officer at the higher level facility to seek proper back referral information.

### 3.3 Continuous quality improvement

There is need to establish standards of care for the provision of referral health care services. Training and education processes will be developed based on these standards of care. The referral system must be opened to revision in the light of practical experience, and in order to meet the goals of the overall health system. Periodically, there may be need to analyse the functioning of the referral system, beyond looking at the statistical patterns and trends. Quality assurance measures will be developed and monitored based on these standards of care.

### 3.4 A diagram illustrating the referral system flow

Figure 1. Referral system flows Cullled from: <http://www.who.int/management/facility/referral/en/index.html>



### 3.5 Guideline for setting up referral system

For referral to be implemented effectively

Develop referral guidelines, which define the conditions to be referred.

The health workers at the primary level need to work together with the health workers from the referral centres to draft a set of guidelines that outlines the conditions best managed on the primary care side and the conditions best referred. Each group will draw this boundary at different places along the continuum depending on multiple factors, including local practice habits, primary care practitioners' chosen scope of practice, previous patterns of referral and local availability of various referral specialists. The guidelines can be indexed either by condition, diagnosis or symptoms and should include current information on how each condition should be managed, including the appropriate use of laboratory and radiological tests, the elements and sequence of the work-up, and expectations around trials of treatment prior to referral. When this is done and there is involvement of all stakeholders in developing the guideline, there is timely feedback from the referral centres

A referral directory of all specialists (either a book or set of referral cards) can be compiled as references guide at all the levels and made available for staff in the health facility. The information can be grouped into different hospitals/services that are available.

Establish a linking of the different levels through an established communication and transport system. In a well-designed referral system, care is decentralized as much as possible, with each level of care playing a specific role.

Visit the facilities that will be receiving referral from the primary level. This could be secondary level facilities or specialist hospitals. A fundamental principle of Primary Health Care (PHC) is the close relationship between all levels of the health care system, starting at the community extending upward to clinic, health centre and district hospital and beyond. Each patient is therefore connected through a seamless continuum of services and should arrive at the appropriate level capable of giving optimal health care for any given problem.

Effective referral requires clear communication and support to assure that the patient receives optimal care at each level of the system.

Design a format for communicating information among the different levels set up a system for supervision for effective functioning of the system and a system for capacity building.

### 4.0 CONCLUSION

Referral can be an important tool in ensuring a continuum of care for clients by helping them to access all the relevant services available to address their physical, psychological and social needs. The concept of a continuum of care encompasses the need for essential health services which should be accessible at several points along a continuum (primary health care, secondary and tertiary health care)

The referral system must be opened to revision in the light of practical experience.

## 5.0 SUMMARY

It would not be an overstatement to say that most referral systems don't work. For it function effectively, it is good to ensure that hospitals concentrate on their roles as referral centres and not made to perform functions of health centres. To realize this, people must be made to have confidence in these health centres by providing the necessary manpower, drugs and facilities.

## 6.0 TUTOR MARKED ASSIGNMENT

Discuss how a referral system can be made to function effectively

## 7.0 REFERENCE AND FURTHER READING

- Akande T. M. (2004) Referral system in Nigeria: study of a tertiary Health facility  
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